

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

الترم الاول





Determine the domain of the following function

The domain of the function $f(x) = \sqrt{x - 5}$ is

ہندذاکر
آن لائن



Determine the domain of the following function

The domain of the function $f(x) = \frac{2}{\sqrt{7-x}}$ is

ہندذاکر
آن لائن



Determine the domain of the following function

The domain of the function $f(x) = \frac{1}{\sqrt[3]{x} - 3}$ is

ہندذاکر
آن لائن



Determine the domain of the following function

The domain of the function $f(x) = \frac{7}{\sqrt{|x| - 2}}$ is

ہندذاکر
آن لائن



Determine the domain of the following function

The domain of the function $f(x) = \sqrt{x^2 - 5x + 6}$ is

ہندذاکر
آن لائن



Determine the domain of the following function

The domain of the function $f(x) = \log_{(x-2)} 5 - x$ is ..

ہندذاکر
آن لائن



Determine the domain of the following function

The domain of the function $f(x) = \frac{\sqrt{x-5}}{\sqrt{9-x}}$ is

ہندذاکر
آن لائن



Determine the range of the following function

The range of the function $f(x) = 2 - \frac{3}{x-1}$ is

ہندذاکر
آن لائن



Determine the rang of the following function

The range of the function $f(x) = 2 - \frac{3}{|x - 1|}$ is

ہندذاکر
آنونلااین



Determine the rang of the following function

The range of the function $f(x) = |x - 3| - 5$ is

ہندذاکر
آن لائن



Determine the rang of the following function

The range of the function $f(x) = \begin{cases} 2 & , x \geq 7 \\ -5 & , x < 7 \end{cases}$ is

ہندذاکر
آن لائن



Essay questions



If the domain of the function $f(x) = \frac{x-5}{x^2-4x+k}$ is $R - \{2\}$
then $k = \dots$

ہندذاکر
آن لائن



Essay questions



If the domain of the function $f(x) = \sqrt{x-a}$ is $[-3, \infty[$ then $a = \dots$

هنذاکر
آنلاین



If $f, g : R \rightarrow R$ where $f(x) = 3x + 1$ and
 $(g + f)(x) = x^3 + 2x - 1$ then $g(-1) = \dots$



1



-1



2



-2

ہندذاکر
آنونلااین



Essay questions



A man deposited 5000L.E in a bank with annual interest 5% then the total money after 7 years isL.E

هنذاكر
أونلاين



If the curve of the function $f(x) = \log_a x$ passes through $(8,3)$ then $a=...$



2



3



-2



-3

هنذاکر
آنلاین



The vertex of the curve $f(x) = x^2 - 4x + 5$ is ...

☐ (1, 2)

☐ (-1, 2)

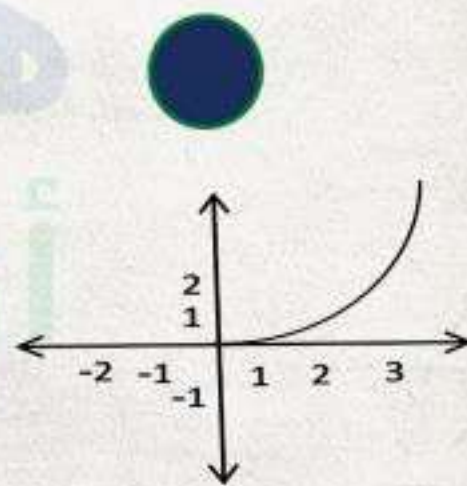
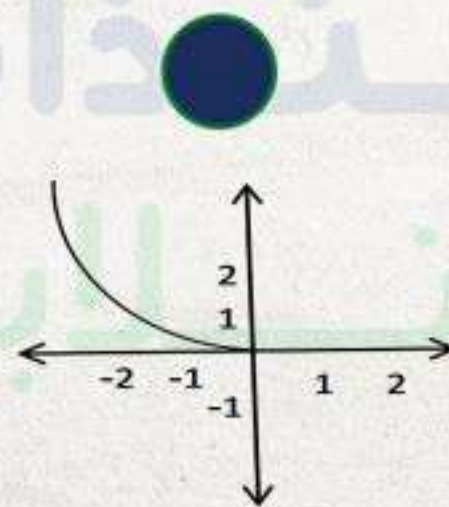
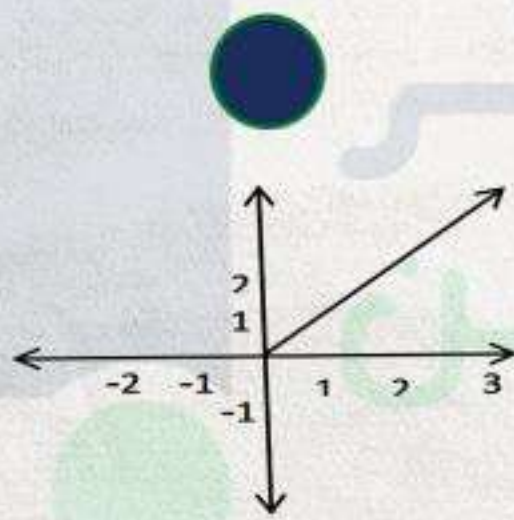
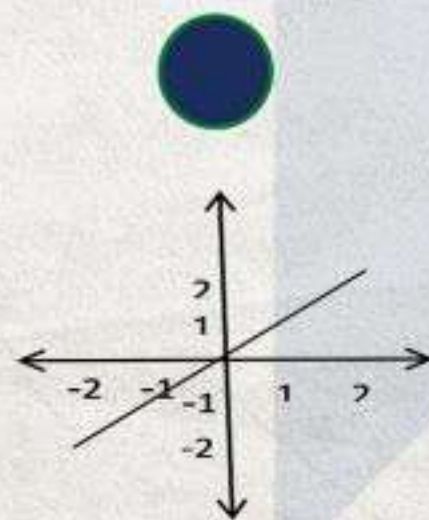
☐ (2, 1)

☐ (-2, 1)

هنذاکر
آنلاین



Which of the following figures represent the curve
of a function **its range $\neq$ its domain** ?





If $f(x) = \{(1,2), (3,5), (4,1)\}$ and $g(x) = \{(1,3), (4,2)\}$

then $(f + g)(x) = \dots$

- ☐ $\{(2,5), (8,3)\}$
- ☐ $\{(1,5), (4,3)\}$
- ☐ $\{(1,5), (8,2), (3,5)\}$
- ☐ otherwise



If the function F is an even function where $f(1)=2$ which of the following points $\in f$

☐ $(-1, 2)$

☐ $(1, -2)$

☐ $(-1, -2)$

☐ $(2, 1)$



If $f(x) = \sqrt{x}$ and $g(x) = x^2$ then

$(f \circ g)(x) = \dots\dots$



x



$\pm x$



$|x|$



$-x$

هنذاکر
آنلاین



Which of the following is one - to - one function?

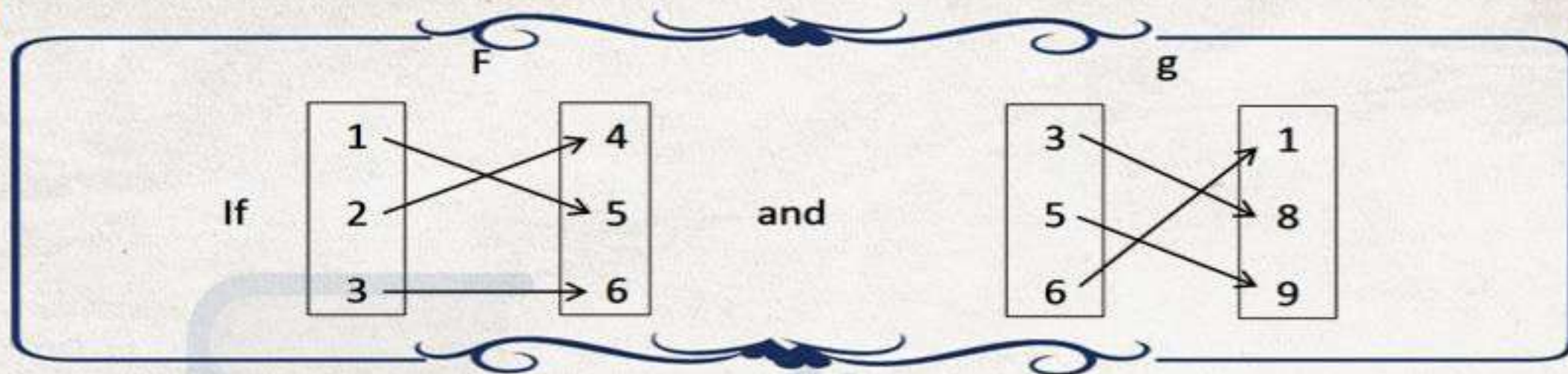
☐ $y = |x|$

☐ $y = x^2$

☐ $y = x^3$

☐ $y = 2$

ہندذاکر
آن لائن



(i) $(f \circ g)(6) = \dots\dots\dots$

[1 , 3 , 5 , 6]

(ii) $(g \circ f)(1) = \dots\dots\dots$

[1 , 5 , 6 , 9]

(iii) $f^{-1}(4) = \dots\dots\dots$

[1 , 2 , 3 , 5]

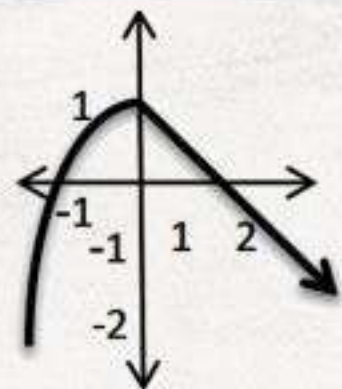
(iv) $g^{-1}(1) = \dots\dots\dots$

[1 , 3 , 5 , 6]



If the opposite figure represent the function $f(x)$

Then $(f \circ f)(2) = \dots\dots\dots$



☐ 2

☐ -1

☐ 0

☐ 1

ہندذاکر
آن لائن



If the function f is the inverse function of g then $(f \circ g)(5) = \dots\dots$



0



5



9



10

ہندذاکر
آن لائن



If $f(x) = x^3$ is translated 4 units to the right and 2 units down then the resulted function is

☐ $-(x + 4)^3 - 2$

☐ $-2 - (x - 4)^3$

☐ $(x - 4)^3 - 2$

☐ $(x + 4)^3 - 2$



If $f(x) = 2^x$ is translated one unit to the left then the resulted function is ...

☐ 2^{x-1}

☐ $2^x - 1$

☐ 2^{x+1}

☐ $2^x + 1$

هنذاكر
أونلاين



The function $f(x) = 3^x$ is the image of $g(x) = -3^x$ by reflection in the straight line



$x=0$



$y=0$



$x=y$



$x = -y$

هنذاکر
آنلاین



If the function f is real function its domain is $[-2,3]$ then the domain of $F(x-2)$ is

☐ $[-4,1]$

☐ $[0,3]$

☐ $[0,5]$

☐ $[-2,3]$



If the function f is real function its domain is $[-2,3]$ then the domain of the function $f(x)+2$ is

☐ $[-4,1]$

☐ $[0,3]$

☐ $[0,5]$

☐ $[-2,3]$



The solution set of the equation $|x + 1| + |x| = 0$ is ...

- ☐ $\{0\}$
- ☐ $\{-1\}$
- ☐ $\{0, -1\}$
- ☐ $\emptyset$



The solution set of the equation $|x - 2| = 2 - x$ is

☐ $\{0\}$

☐ $] -\infty, 2]$

☐ $] -\infty, 2[$

☐ $\emptyset$

ہندذاکر
آنونلااین



The solution set of the inequality $\sqrt{x^2 - 6x + 9} \leq 3$ is

☐ R^-

☐ $R -]0,6[$

☐ $[0,6]$

☐ R^+

هناذاكر
أونلاين



If $x \in [-1, 4]$ then $|2x - 3| \leq \dots$



1



4



5



8

ہندذاکر
آنونلااین



If $x > 0$, $y < 0$ then $\sqrt{x^2} + \sqrt{y^2} - (x + y) = \dots\dots$

- ☐ 0
- ☐ $2x$
- ☐ $2y$
- ☐ $-2y$

ہندذاکر
آنونلایین



If $3^x = 2$ then $3^{x+2} = \dots$

- ☐ 4
- ☐ 6
- ☐ 12
- ☐ 18

هنذاکر
آنلاین



The S.S of the equation $x^{\frac{4}{3}} - 10 \times x^{\frac{2}{3}} + 9 = 0$

- ☐ {1,27}
- ☐ $\{\pm 1, \pm 27\}$
- ☐ $\{-1, 27\}$
- ☐ $\{\pm 27\}$



If $f(x) = a^x$, then $f(x + 1) \times f(x - 1) = f(\dots)$

☐ 2

☐ a^{2x}

☐ $2x$

☐ x^2

ہندذاکر
آن لائن



If $f(x) = a^x$, $a > 1$ and $f(x) < 1$ then $x \in \dots$

☐ R^+

☐ R^-

☐ $]0,1[$

☐ $]1, \infty[$

هنذاکر
آنلاین



If $f(x) = (a - 2)^x$ then $x \in \dots$



R^+



$R^+ - \{1\}$



$]2, \infty[$



$]2, \infty[- \{3\}$

هنگذاگر
آنلاین



If (a,b) lies on the curve $f(x)=2^x$ which of the following points $\in$ the function

$$g(x) = \left(\frac{1}{2}\right)^x$$

- ☐ (a,b)
- ☐ $(-a,b)$
- ☐ $(a,-b)$
- ☐ $(a, \frac{1}{2}b)$



The image of the point $(3,5)$ by reflection in the straight line $y=x$ is

☐ $(3,-5)$

☐ $(5,3)$

☐ $(5,-3)$

☐ $(-3,-5)$

هنذاکر
آنلاین



If $\log 2 = x$ and $\log 3 = y$ then $\log 24 = \dots$

☐ $x^3 + y$

☐ $x + y^3$

☐ $3x + y$

☐ $x + 3y$

ہندذاکر
آن لائن



If the curve $y = \log_4(1 - ax)$ passes through the point $\left(\frac{1}{4}, -\frac{1}{2}\right)$
then $a = \dots$



2



3



4



6

هنذاکر
آنلاین



$$\log_{ab} \frac{1}{a} + \log_{ab} \frac{1}{b} = \dots$$

☐ $\frac{a}{b}$

☐ $\frac{b}{a}$

☐ 1

☐ -1

هنذاکر
آونلاين



$$\log_b a \times \log_c b \times \log_d c = \dots$$



1



$\log a$



$\log d$



$\log_d a$

هنذاگر
آنلاین



If $\log_x y = \log_y x$ then



$x = y$



$x = \frac{1}{y}$



$y = x^2$



a, b together



$$3^{\log_3 x} = \dots$$

- ☐ 1
- ☐ 3
- ☐ x
- ☐ $3x$

هنذاکر
آونلاين



$$\log \tan 1^\circ + \log \tan 2^\circ + \log \tan 3^\circ + \dots + \log \tan 88^\circ + \log \tan 89^\circ = \dots\dots\dots$$

☐ Zero

☐ 1

☐ 10

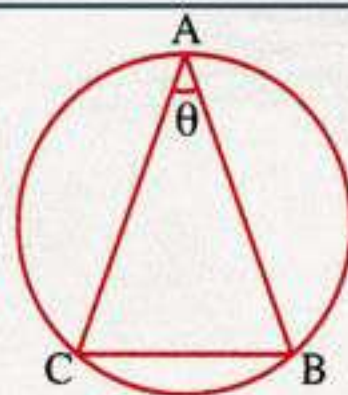
☐ 89

ہندذاکر
آن لائن



In the opposite figure :

ABC is a triangle inscribed in a circle whose radius length is 4 cm. , $m(\angle BAC) = \theta^{\text{rad}}$, then $\lim_{\theta^{\text{rad}} \rightarrow 0} \frac{BC}{\theta^{\text{rad}}} = \dots\dots\dots$



2



4



6



8

هنذاکر
آونلاين



If the ratio among the measures of the angles of a triangle is $8 : 3 : 1$, then the ratio between the longest two sides in the triangle is

☐ $\sqrt{3} : 2$

☐ $\sqrt{6} : 2$

☐ $8 : 3$

☐ $8 : 5$

ہندذاکر
آنونلااین



If $3^a = 4^b$, then $9^{\frac{a}{b}} + 16^{\frac{b}{a}} = \dots\dots\dots$

- ☐ 7
- ☐ 12
- ☐ 20
- ☐ 25

ہندذاکر
آنونلایین



If $\lim_{x \rightarrow \infty} \frac{3k|x|}{4x+3} = 6$, then $k = \dots\dots\dots$



6



$\frac{3}{4}$



8



3

ہندذاکر
آن لائن



If $f(x) = x^3$, then the image of the curve of f by reflection in x -axis and translation 3 units in the direction of $\overrightarrow{OX}$ and two units in the direction of $\overrightarrow{Oy}$ is

- ☐ $-(x-3)^3 - 2$
- ☐ $-(x+3)^3 + 2$
- ☐ $-(x+3)^3 - 2$
- ☐ $-[(x+3)^3 + 2]$



If $f(x) = x + 1$, $g(x) = \frac{x^2 - 1}{x - 1}$, then $\lim_{x \rightarrow 1} (g \circ f)(x) = \dots\dots\dots$

☐ 1

☐ 2

☐ -2

☐ 3

ہندذاکر
آنونلااین



If $\log_2 3 \times \log_3 4 \times \log_4 5 \times \dots \times \log_n (n+1) = 10$, then $n = \dots\dots\dots$

- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 1023

ہندذاکر
آن لائن



The domain of the function $f : f(x) = \sqrt{\sqrt{x^2 - 1}}$ is

- ☐ $] -1, 1[$
- ☐ $[-1, 1]$
- ☐ $\mathbb{R} -] -1, 1[$
- ☐ $\mathbb{R} - \{-1, 1\}$



In $\triangle ABC$, $m(\angle A) = 112^\circ$, $m(\angle B) = 33^\circ$, $c = 19$ cm.
 , then the diameter length of its circumcircle $\simeq$ cm.

☐ 16

☐ 17

☐ 32

☐ 33

ہندذاکر
آن لائن



If $2^x = 20$, $n < x < n + 1$, n is an integer , then $n = \dots\dots\dots$

- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 10

ہندذاکر
آنونلایین



$$\text{In } \Delta XYZ, y^2 + z^2 - x^2 = 2yz \times \dots\dots\dots$$

☐ $\cos x$

☐ $\sin Z$

☐ $\cos Z$

☐ $\sin x$

ہندوستان
آن لائن



If the function $f : f(x) = \begin{cases} 3x - 1 & , \quad x \neq 2 \\ 6 & , \quad x = 2 \end{cases}$, then $\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$

☐ - 5

☐ 5

☐ 6

☐ Does not exist.

ہندذاکر
آنونلااین



If $f(x) = \log_2(x + a)$ and $f^{-1}(2) = -3$, then $a = \dots\dots\dots$

☐ -7

☐ 7

☐ 3

☐ 1

ہندذاکر
آن لائن



The exponential function whose base is a , is increasing if



$$a > 0$$



$$a > 1$$



$$0 < a < 1$$



$$a = 1$$

هنذاکر
آنلاین



$$\lim_{x \rightarrow \infty} (4 - 3x - x^3) = \dots\dots\dots$$



∞



does not exist.



-1



$-\infty$

هنذاکر
اونلاين



If f is an odd function , $a \in$ the domain of f , then $f(a) + f(-a) = \dots\dots\dots$

- ☐ $2 f(a)$
- ☐ $2 f(-a)$
- ☐ zero
- ☐ $f(a)$



If f is an odd function , then $\frac{2 f (3) + 7 f (-3)}{10 f (-3)} = \dots\dots\dots$

☐ 3

☐ -3

☐ $\frac{1}{2}$

☐ $-\frac{1}{2}$

ہندذاکر
آنونلااین



If $f(x) = \sqrt{x+3}$, $g(x) = \sqrt{6-x}$, then $(f \circ g)(5) = \dots\dots\dots$

- ☐ undefined
- ☐ zero
- ☐ 5
- ☐ 2

ہندذاکر
آنونلااین



The range of the function $f : f(x) = \begin{cases} 2x+3 & , \quad x > 3 \\ 9 & , \quad x < 3 \end{cases}$ is

☐ {3}

☐ $\mathbb{R}$

☐ $]9, \infty[$

☐ $[9, \infty[$

ہندذاکر
آنونلااین



In $\triangle ABC$, if $m(\angle B) = 60^\circ$, $m(\angle C) = 30^\circ$, $c = 4$ cm. , then $b = \dots\dots\dots$ cm.



4



8



$2\sqrt{3}$



$4\sqrt{3}$

ہندذاکر
آن لائن



If the area of ΔABC is " X " and the radius length of its circumcircle is " r "

, then $\frac{4 r X}{a b c} = \dots\dots\dots$

☐ $\frac{a}{\sin A}$

☐ $\cos A$

☐ 1

☐ r

ہندذاکر
آنونلااین



If $\lim_{x \rightarrow a^+} f(x) = l$, $\lim_{x \rightarrow a^-} f(x) = m$ and the function is continuous at $x = a$
 , then $l^2 + m^2 - 2lm = \dots\dots\dots$

- ☐ 1
- ☐ 3
- ☐ zero
- ☐ 6

ہندذاکر
آنونلااین



If $a = \sin B$, $b = \sin C$, $c = \sin A$, then the circumference of the circumcircle of triangle ABC equals



1



2π



$\frac{1}{2}\pi$



π

ہندذاکر
آنونلااین



The solution set of the inequality : $\sqrt{9x^2 - 12x + 4} + 2|4 - 6x| \geq 20$ is

☐ $\mathbb{R} -]\frac{-2}{3}, 2[$

☐ $] \frac{-2}{3}, 2[$

☐ $\mathbb{R} - [\frac{-2}{3}, 2]$

☐ $[\frac{-2}{3}, 2]$



Essay questions



If the function $f : f(x) = \begin{cases} x^2 + a x - 2 & , \quad x > 2 \\ 4 & , \quad x = 2 \\ 5 a + b x & , \quad x < 2 \end{cases}$ is continuous at $x = 2$, find the value of each of a , b

هنذاکر
آنلاین



Essay questions



Find algebraically in $\mathbb{R}$ the solution set of the equation : $|x - 3| = |9 - 2x|$

هنذاكر
أونلاين



Essay questions



$$\text{If } f(x) = 7^{x+1}$$

, find the value of x which satisfies : $f(2x-1) + f(x-2) = 50$

ہندذاکر
آنونلاین



Essay questions



If $\lim_{x \rightarrow a} |3x + 2| = 14$, find the value of : a

ہندذاکر
آنونلااین



Essay questions



Find the value of each of a and n if : $\lim_{x \rightarrow \infty} \frac{4ax^n - 4x + 5}{3 - 9x + 8x^2} = 3$

هنذاكر
أونلاين



Essay questions



$$\lim_{x \rightarrow \infty} \left(\frac{x+1}{\sqrt{x^2-1}} + a^{\frac{1}{x}} \right) \text{ where } a \text{ is positive.}$$

هنذاکر
آنلاین

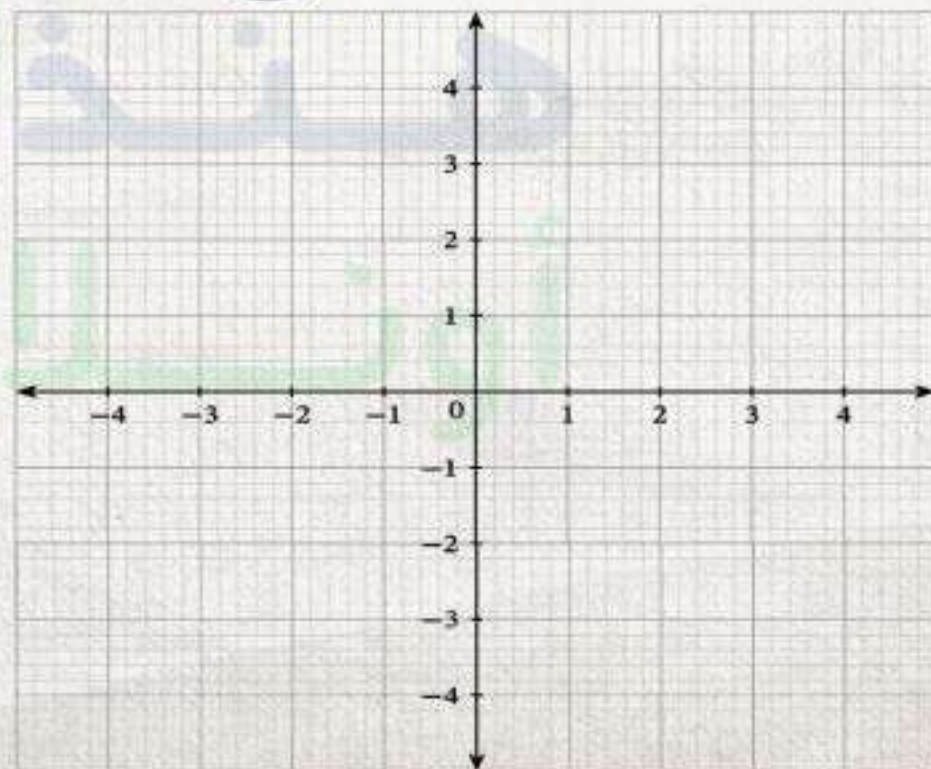


Essay questions



Represent graphically the following functions:

$$f(x) = 2 - x^2$$



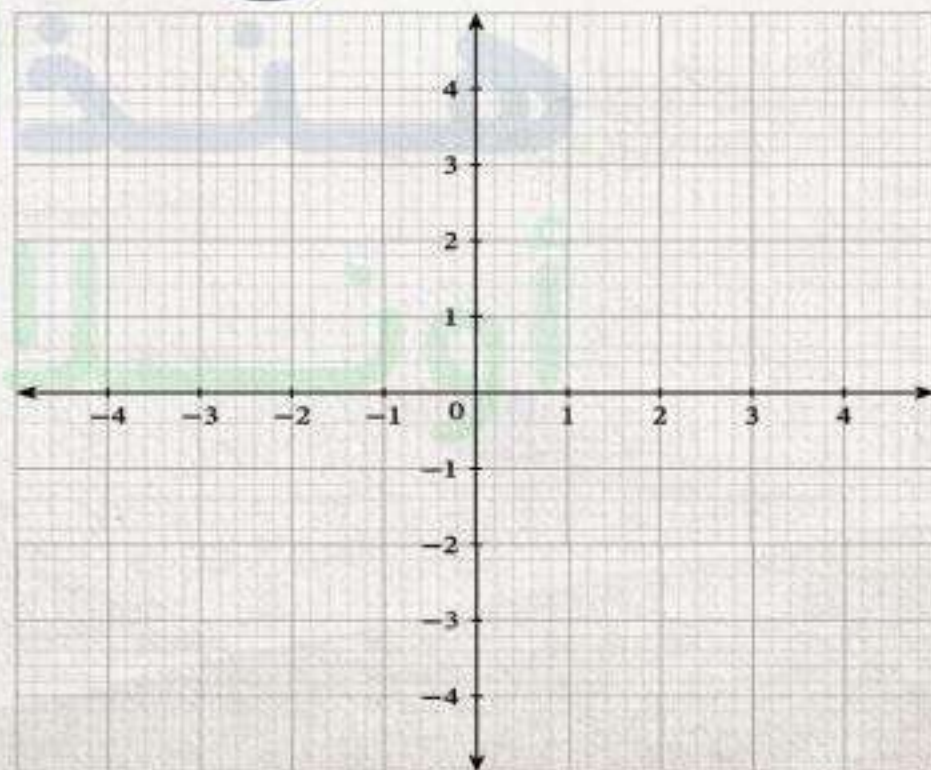


Essay questions



Represent graphically the following functions:

$$f(x) = \frac{x-1}{x}$$



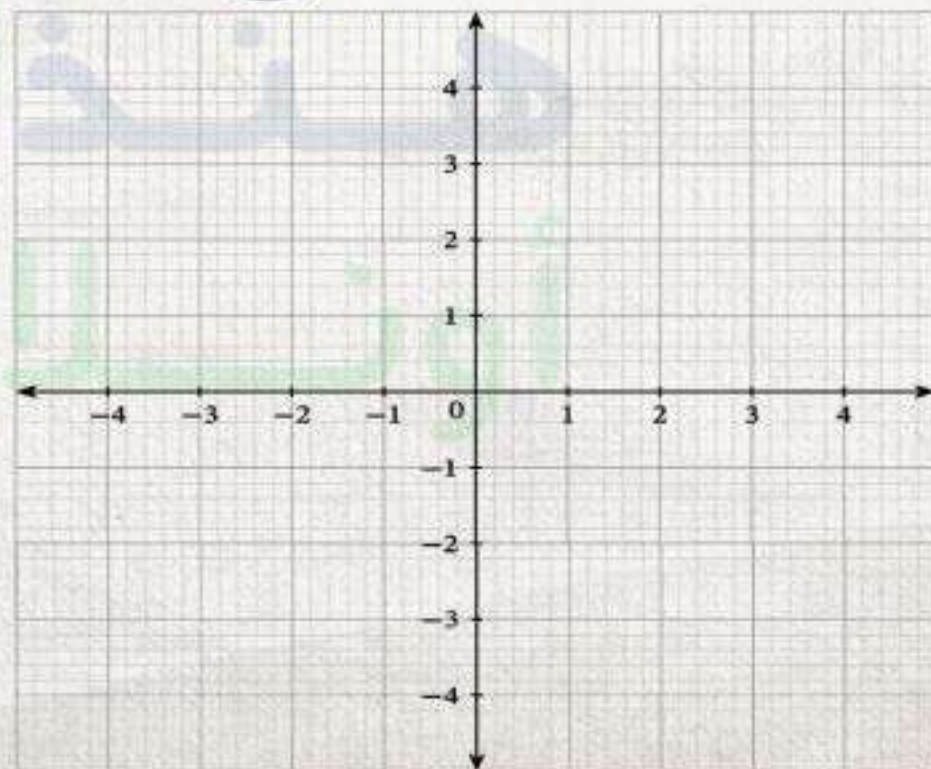


Essay questions



Represent graphically the following functions:

$$f(x) = (x - 1)^3$$



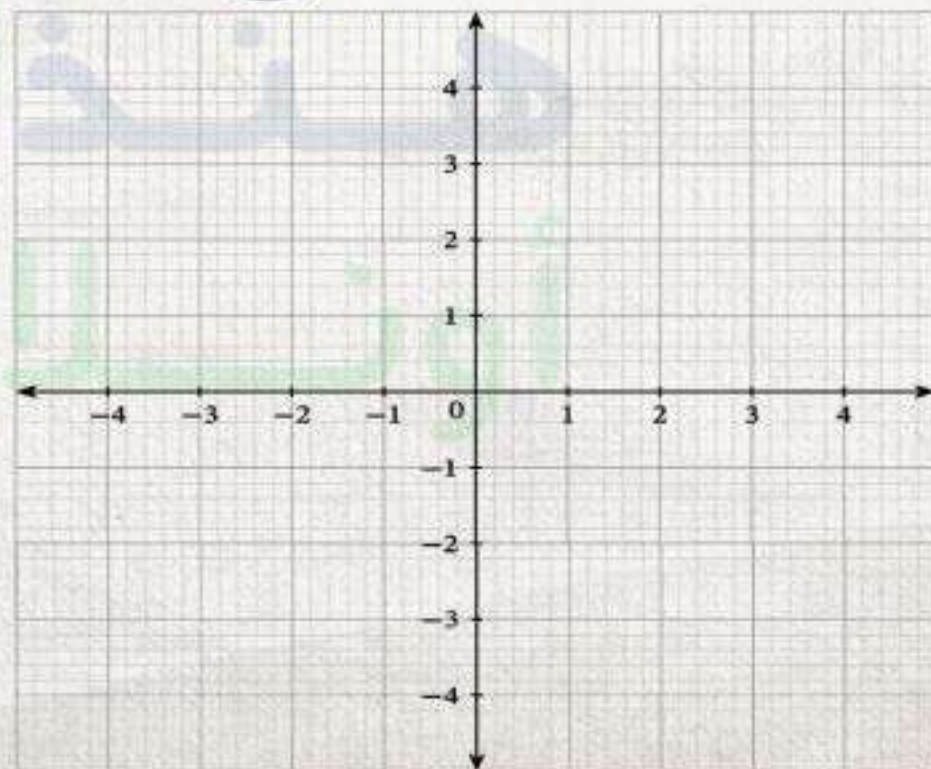


Essay questions



Represent graphically the following functions:

$$f(x) = |x + 1| - 2$$





Find each of the following

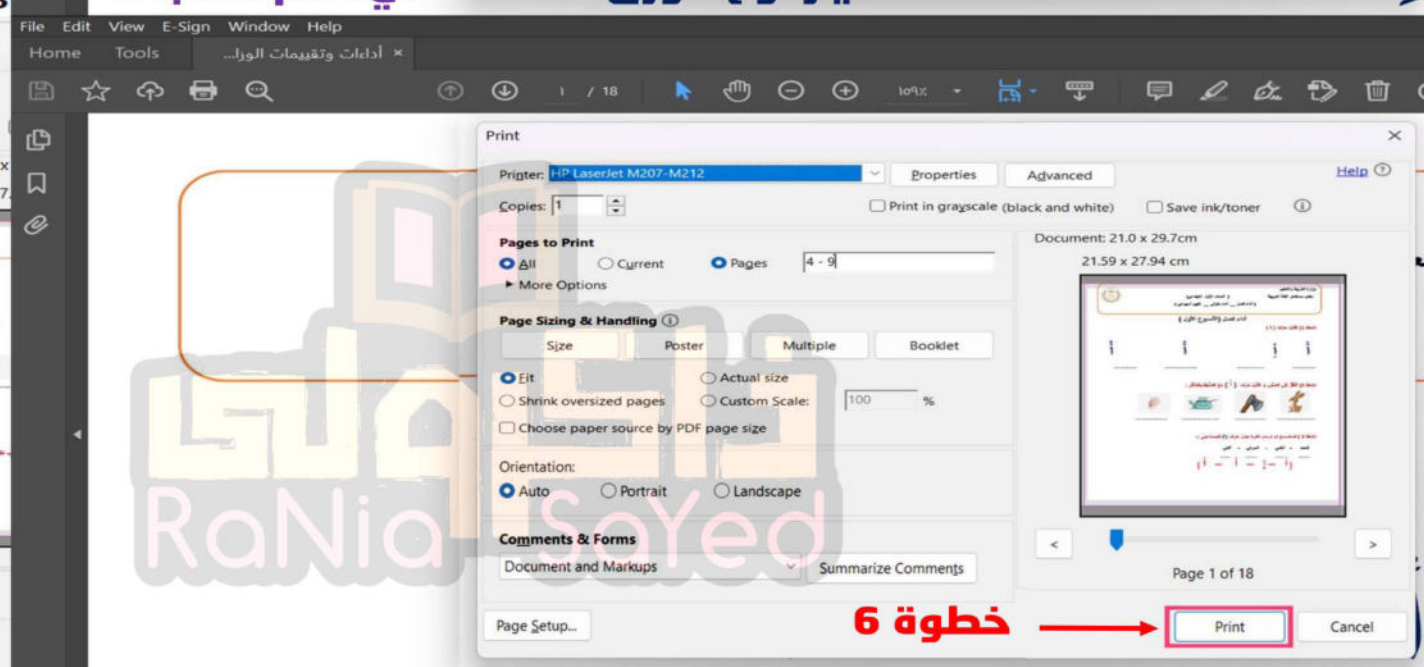
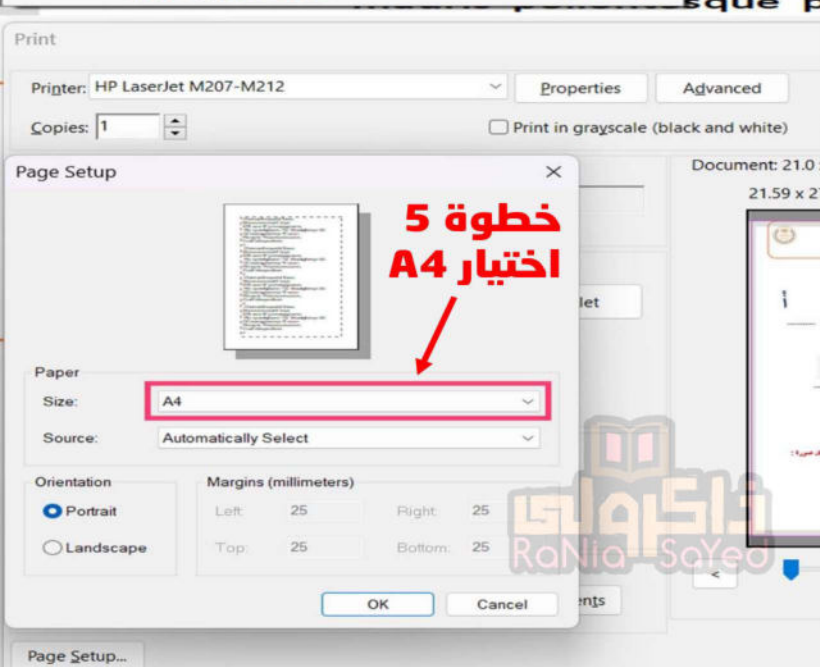
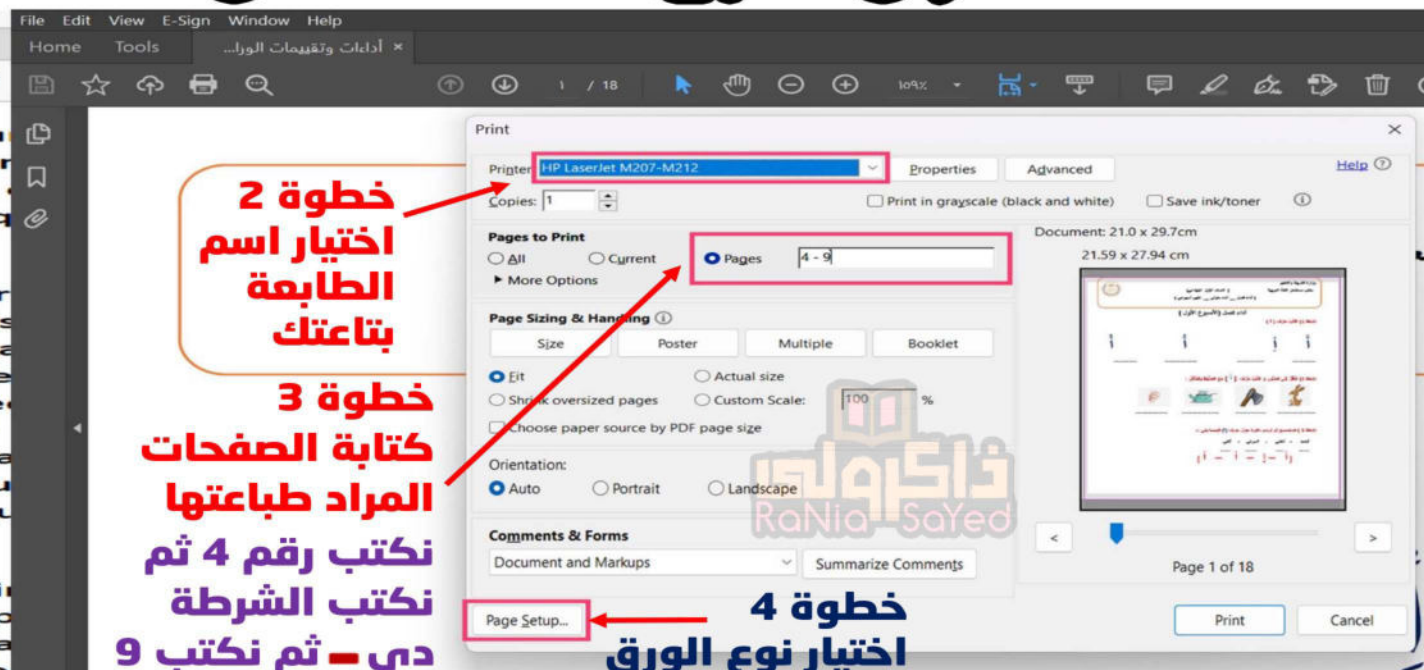


$$\lim_{x \rightarrow 0} \frac{(2x-1)^2 - 1}{5x}$$

$$\lim_{x \rightarrow 9} \frac{x + \sqrt{x} - 12}{x - 9}$$

ہندذاکر
آنونلااین

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الاول



Choose the correct answer:

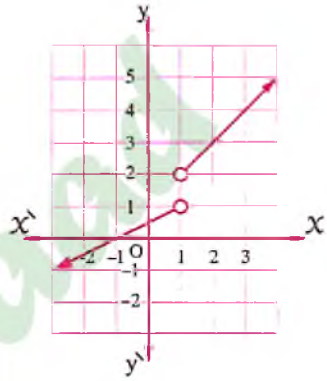
1)	Solution set of the inequality : $x + 2 \leq -3$ in $\mathbb{R}$ is (a) $\mathbb{R}$ (b) $\emptyset$ (c) $[-5, 1]$ (d) $] -5, 1[$	
2)	If $f(x) = \begin{cases} \frac{\sqrt{1+x}-1}{x} & , \text{ when } x \neq 0 \\ k & , \text{ when } x = 0 \end{cases}$ continuous at $x = 0$, then $k = \dots\dots\dots$ (a) 0 (b) 2 (c) $\frac{1}{2}$ (d) -1	
3)	Domain of the function $f : f(x) = \sqrt{x+2}$ is (a) $[-2, \infty[$ (b) $[-2, 2]$ (c) $] -\infty, 2]$ (d) $\mathbb{R}$	
4)	$\lim_{x \rightarrow 0} \frac{\sin 2x + \tan 3x}{5x} = \dots\dots\dots$ (a) 0 (b) 5 (c) 2 (d) 1	
5)	If $\log 2 = x$, $\log 3 = y$, then $\log 6 = \dots\dots\dots$ (a) xy (b) $x \div y$ (c) $x + y$ (d) x^y	
6)	$\lim_{x \rightarrow 2} \frac{2x^2 - x - k}{x^2 - x - 2} = \frac{7}{3}$, then $k = \dots\dots\dots$ (a) 2 (b) 7 (c) -6 (d) 6	

6)	$\lim_{x \rightarrow \infty} \frac{5x^{-3} - x^{-1} + 5}{2x^{-3} + 2x^{-1} + 7} = \dots\dots\dots$ (a) $\frac{5}{7}$ (b) $\frac{7}{5}$ (c) $\frac{1}{2}$ (d) $\frac{5}{2}$	
7)	If $5^x = 2$, then $5^{x+2} = \dots\dots\dots$ (a) 5 (b) 2 (c) 25 (d) 50	
8)	In ΔXYZ if $x = 5$ cm. , $y = 7$ cm. , $z = 8$ cm. , then $m(\angle Y) = \dots\dots\dots$ (a) 30° (b) 60° (c) 45° (d) 120°	
9)	Solution set of the equation $(2x + 3)^{\frac{4}{3}} = 81$ in $\mathbb{R}$ is $\dots\dots\dots$ (a) $\{12, -12\}$ (b) $\{15, -15\}$ (c) $\{15, -15\}$ (d) $\{0\}$	
10)	$\lim_{x \rightarrow 0} \left(\frac{x^2 + 2x}{x} \right) = \dots\dots\dots$ (a) 2 (b) 1 (c) 0 (d) -2	
11)	$\log_2 7 \times \log_7 2 = \dots\dots\dots$ (a) 0 (b) 2 (c) 1 (d) 3	
12)	In ΔABC if $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$ (a) $6 : 5 : 8$ (b) $8 : 5 : 6$ (c) $7 : 2 : 4$ (d) $3 : 5 : 6$	

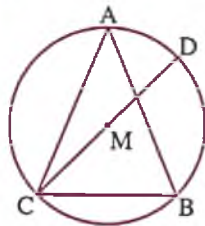
13)	Range of the function $f : f(x) = \left \frac{1}{x} \right$ is (a) $]-\infty, \infty[$ (b) $]0, \infty[$ (c) $[0, \infty[$ (d) $\mathbb{R} - \{0\}$	
14)	The curve of the function $f : f(x) = -2(x-1)^3 + 2$ is symmetric about the point (a) $(-1, 2)$ (b) $(1, -2)$ (c) $(0, 0)$ (d) $(1, 2)$	
15)	$\lim_{x \rightarrow -3} \frac{x^5 + 243}{x^3 + 27} = \dots\dots\dots$ (a) 15 (b) -15 (c) 3 (d) $\frac{5}{3}$	
16)	If $\log x \in]0, 1[$, then $x \in \dots\dots\dots$ (a) $]0, 1[$ (b) $]1, 2[$ (c) $]1, 10[$ (d) $]-\infty, 1[$	
17)	$\lim_{x \rightarrow 3} \sqrt{x-3} = \dots\dots\dots$ (a) -3 (b) 3 (c) 0 (d) does not exist	
18)	In ΔDEF if $m(\angle E) = 35^\circ$, $m(\angle F) = 40^\circ$, $EF = 12$ cm. , then $DE \approx \dots\dots\dots$ to nearest centimeter. (a) 2 (b) 3 (c) 8 (d) $\sqrt{3}$	
19)	In ΔABC if $a = 4$ cm. , $c = 16$ cm. , $m(\angle B) = 115^\circ$, then $b \approx \dots\dots\dots$ cm. (a) 326 (b) 18 (c) 20 (d) 16	
20)	If $\log_4(x^3 - 11) = 2$, then $x = \dots\dots\dots$ (a) 3 (b) 16 (c) 27 (d) 11	

21)	If f is function where $f(x) = x - 3$, then $f^{-1}(x) = \dots\dots\dots$ (a) $x + 3$ (b) $-x + 3$ (c) $x - 3$ (d) $\frac{1}{x-3}$	
22)	If r is the radius length of circumcircle of ΔXYZ, then $\frac{x}{4 \sin X} = \dots\dots\dots$ (a) r (b) $2r$ (c) $\frac{1}{2}r$ (d) $\frac{1}{4}r$	
23)	Function f where $f(x) = a^x$ is increasing on its domain when $\dots\dots\dots$ (a) $a = 1$ (b) $a > 1$ (c) $a = -1$ (d) $0 < a < 1$	
24)	If $f(x) = 2x + 1$, $(f \circ g)(x) = 3x + 2$, then $g(x) = \dots\dots\dots$ (a) $x + 1$ (b) $5x + 3$ (c) $\frac{3}{2}x + \frac{1}{2}$ (d) $2x + 3$	
25)	$\lim_{x \rightarrow 0} \frac{(x+2)^5 - 32}{x} = \dots\dots\dots$ (a) 4 (b) 16 (c) 32 (d) 80	
26)	The domain of the function $f : f(x) = \frac{5}{\sqrt{x-4}}$ is $\dots\dots\dots$ (a) $[4, \infty[$ (b) $]4, \infty[$ (c) $] - \infty, 4]$ (d) $] - \infty, 4[$	
27)	Which of the following functions is a one-to-one function? $\dots\dots\dots$ (a) $f(x) = \cos x$ (b) $g(x) = x^2$ (c) $h(x) = x^3$ (d) $k(x) = x^4 + x^2$	
28)	If f is a function where $f(x) = 7x$, then $f^{-1}(x) = \dots\dots\dots$ (a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$	

29)	The range of the function $f : f(x) = \frac{x^2 - 1}{x - i}$ is (a) $\mathbb{R}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R} - \{2\}$ (d) $\{1\}$	
30)	$\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} = \dots\dots\dots$ (a) $\frac{5}{7}$ (b) $\frac{1}{7}$ (c) -1 (d) -5	
31)	The vertex point of the curve of the function $f : f(x) = x + 3 - 2$ is (a) $(3, 2)$ (b) $(-3, -2)$ (c) $(-3, 2)$ (d) $(3, -2)$	
32)	If $\lim_{x \rightarrow a} \frac{x^8 - a^8}{x^6 - a^6} = 48$, then $a = \dots\dots\dots$ (a) 4 (b) 6 (c) ± 4 (d) ± 6	
33)	If $f(x) = 3x - 1$, $g(x) = x^2$, then $(g \circ f)(-2) = \dots\dots\dots$ (a) -7 (b) 11 (c) -49 (d) 49	
34)	$\lim_{x \rightarrow 2} \frac{x^3 - 8}{3x^2 - 12} = \dots\dots\dots$ (a) 1 (b) 2 (c) 0 (d) 3	
35)	The solution set of the inequality $3 - x > 0$ is (a) $]-3, 3[$ (b) $\mathbb{R} - [-3, 3]$ (c) $\mathbb{R} - \{3\}$ (d) $\mathbb{R}$	
36)	The solution set of the equation : $x + 2 + x = -2$ is (a) $\emptyset$ (b) $\mathbb{R}$ (c) $]-\infty, 2[$ (d) $]-\infty, -2]$	

44)	In ΔXYZ , if $X = y$, then $\cos X = \dots\dots\dots$ (a) $\frac{2y^2}{z}$ (b) $\frac{z}{2y}$ (c) $\frac{z}{4x}$ (d) $\frac{y}{2x}$	
45)	If the opposite figure represents the graph of function f , then $\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$ (a) 2 (b) 3 (c) 1 (d) does not exist.	
46)	In ΔXYZ , if $3 \sin X = 4 \sin Y = 2 \sin Z$, then $X : y : z = \dots\dots\dots$ (a) 2 : 3 : 4 (b) 6 : 4 : 3 (c) 3 : 4 : 6 (d) 4 : 3 : 6	
47)	ABC is an equilateral triangle , its side length equals $8\sqrt{3}$ cm. , then the length of the diameter of its circumcircle equals $\dots\dots\dots$ cm. (a) 8 (b) $16\sqrt{3}$ (c) 16 (d) $4\sqrt{3}$	
48)	The curve of the function $g : g(x) = x - 2$ is the same as the curve of the function $f : f(x) = x$ by translation two units in direction of $\dots\dots\dots$ (a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX}$ (c) $\overrightarrow{OY}$ (d) $\overrightarrow{OY}$	
49)	The point of symmetry of the curve of the function $f : f(x) = \frac{1}{x-3} + 4$ is $\dots\dots\dots$ (a) (3 , -4) (b) (-3 , -4) (c) (3 , 4) (d) (-3 , 4)	

50)	The solution set of the inequality : $2x - 5 \leq 9$ in $\mathbb{R}$ is (a) $]-\infty, 7[$ (b) $\mathbb{R} - [-2, 7]$ (c) $\mathbb{R} -]-2, 7[$ (d) $[-2, 7]$
51)	If $x^{\frac{3}{2}} = 64$, then $x =$ (a) 2 (b) 4 (c) 16 (d) 512
52)	The exponential function of base a is decreasing if (a) $a > 0$ (b) $a < 0$ (c) $0 < a < 1$ (d) $-1 < a < 0$
53)	The expression $\frac{3 \log 2}{\log 4 + \log 3}$ is equivalent to (a) $\log_3 2$ (b) $\log_7 2$ (c) $\log_{12} 8$ (d) $\log_7 8$
54)	If $3^{x+5} = \frac{1}{27}$, then $x =$ (a) - 8 (b) - 3 (c) 3 (d) 8
55)	If $7^{x+1} = 3^{2x+2}$, then $5^{x+1} =$ (a) 2 (b) zero (c) 1 (d) 5
56)	If the function f^{-1} where $f^{-1} = \{(2, 3), (5, b)\}$ is the inverse function of the function f where $f = \{(4, 5), (a, 2)\}$, then $a - b =$ (a) - 1 (b) zero (c) 1 (d) 2

63)	The solution set of the equation : $x + 3 = 0$ in $\mathbb{R}$ is (a) $\{-3\}$ (b) $\{3\}$ (c) $\{-3, 3\}$ (d) $\emptyset$	
64)	If $\lim_{x \rightarrow 0} \frac{(a+3)x}{\sin ax} = \frac{2}{5}$, then a = (a) -5 (b) -3 (c) -1 (d) 3	
65)	In the opposite figure : $\angle A$ is acute angle , where $\sin A = \frac{1}{3}$, BC = 6 cm. , then $\cos (\angle DCB) = \dots\dots\dots$ (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{6}$ 	
66)	If $f(x) = 2^x$, then the S.S. of the equation : $f(2x) - 6f(x) + 8 = 0$ in $\mathbb{R}$ is (a) $\{1\}$ (b) $\{2\}$ (c) $\{1, 2\}$ (d) $\emptyset$	
Answer the following questions :		
1)	Draw the curve of the function $f(x) = 2 - (x-1)^2$ and from the graph find its monotony and discuss its type for being even , odd or neither even nor odd.	
2)	Draw the curve of the function : $f(x) = x-2 + 3$, explain from the drawing the range of the function , discuss its monotony and determine its type if it is even , odd or otherwise.	

3)	Graph the following function : $f(x) = \frac{1}{x-2} + 3$, then determine its domain and range.	
4)	If $f(x) = \begin{cases} \frac{x^2-7x+12}{x-3} & , x > 3 \\ 2x-7 & , x < 3 \end{cases}$ discuss the existence of $\lim_{x \rightarrow 3} f(x)$	
5)	Discuss the continuity of the function f where : $f(x) = \begin{cases} 4x-1 & , x \leq 1 \\ x^2+2 & , x > 1 \end{cases}$ at $x = 1$	
6)	[a] Find : $\lim_{x \rightarrow 2} \frac{x^2-4}{x^2-5x+6}$ [b] Find : $\lim_{x \rightarrow 5} \frac{\sqrt{x-1}-2}{x-5}$	
7)	Find : $\lim_{x \rightarrow -3} \frac{x^4-81}{x^5+243}$ If $a \in \mathbb{R}$ and $\lim_{x \rightarrow \infty} \frac{(a+1)x^3-6x^2+4}{2x^2+5x-1} = -3$, then find the value of a	

حمل الآن

مجاناً وحصرياً

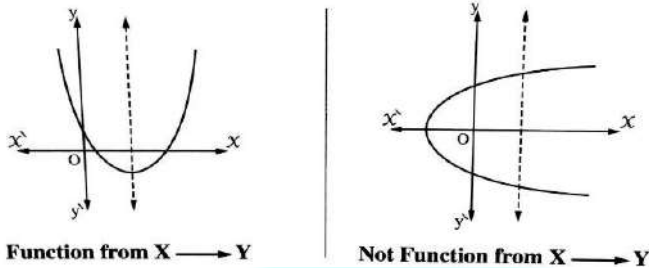
المراجعة رقم (3)

الترم الاول



1) Graphically (The vertical line test)

The relation is not a function if there exists at least one straight line parallel to y-axis and intersects the graph of the relation at more than one point



2) Algebraically

Let x and y be two non-empty sets, any relation R from the set X to set Y is called a function

If $\forall x \in X$ there exists one and only one $y \in Y$

s.t. $Y = f(x)$

- X is called the domain of the function F
- Y is called the co-domain of the function F

Show giving reasons, which of the following two relations is a function on R

1) $y = x^2 + 3$

The relation $y = x^2 + 3$ is a function because every real value of the variable x is related with a unique value of the variable y

2) $y^2 = x^2 + 9$

is not a function because there is at least one real value of the variable x is related with two different values of the variable y when $x = 4$ then

$$y^2 = 25 \quad y = \pm 5$$

The Range:

Let $f: X \rightarrow Y$, then the range of the function f

is the set of all images (y) s.t. $y = f(x)$

First Identifying the domain of the function from its rule

1) Polynomial function If $f(x)$ is a polynomial, then its domain = R

2) Rational function

If f is a rational function where $f(x) = \frac{h(x)}{g(x)}$, h and g are two polynomials, then the domain of the function $f = R - z(g)$ ($z(g)$ The set of zeroes of the denominator)

3) The n^{th} root function

If $f(x) = \sqrt[n]{h(x)}$ where $n \in \mathbb{Z}^+$, $n > 1$, $h(x)$ is a polynomial

First: When (n) is an odd number, then the domain of $f = R$

Second: When (n) is an even number, then:

The domain of f is the set of all values of x which satisfy $h(x) \geq 0$, n is called the index of the root

4) Piecewise-function

It is the function that is defined by the different rules for different parts of its domain

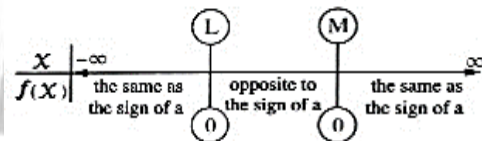
$$f(x) = \begin{cases} 2 - x & \text{when } x < 0 \\ x + 2 & \text{when } x > 0 \end{cases}$$

Remember that:

If l and m are the roots of the equation

$$ax^2 + bx + c = 0$$

S.t. $a > 0$, then the solution set for each in R is

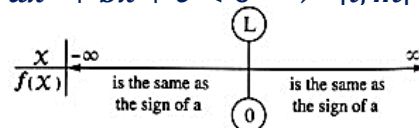


$$1) ax^2 + bx + c \geq 0 \Rightarrow R -]l, m[$$

$$2) ax^2 + bx + c > 0 \Rightarrow R - [l, m]$$

$$3) ax^2 + bx + c \leq 0 \Rightarrow [l, m]$$

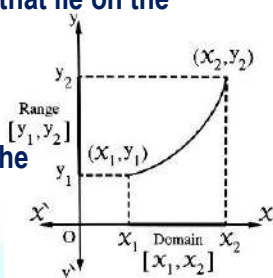
$$4) ax^2 + bx + c < 0 \Rightarrow]l, m[$$



Identifying the domain and the range of the function from its graph

1) Domain of the function is the set of the x - *coordinates* of all the points that lie on the curve
Of the function

2) Range of the function is the set of the y - *coordinates* of all the curve
Of the function



Monotonicity of a function

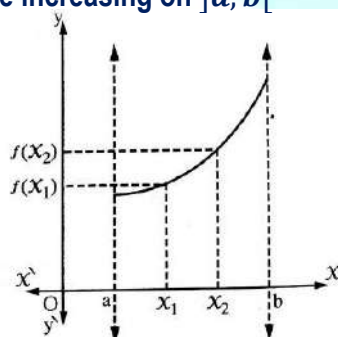
1) Increasing function

*the function $f(x)$ is said to be increasing on $]a, b[$

If $\forall x_1 < x_2$

$$\rightarrow f(x_1) < f(x_2)$$

s.t $x_1, x_2 \in]a, b[$



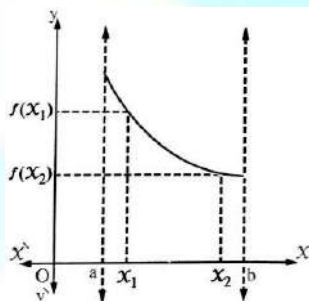
2) Decreasing function

*the function $f(x)$ is said to be decreasing on $]a, b[$

If $\forall x_1 < x_2$

$$\rightarrow f(x_1) > f(x_2)$$

s.t $x_1, x_2 \in]a, b[$

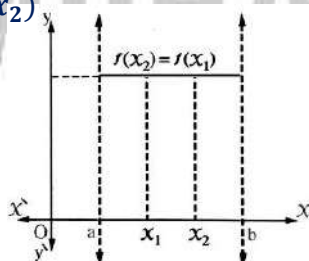


3) Constant function

*the function $f(x)$ is said to be constant on $]a, b[$

If $\forall x_1 < x_2 \rightarrow f(x_1) = f(x_2)$

s.t $x_1, x_2 \in]a, b[$



Firstly: Operation on functions

Def let f_1 and f_2 are two functions whose domains are D_1 and D_2 respectively

S.t $f_1 : D_1 \rightarrow R$ and $f_2 : D_2 \rightarrow R$
Then

$$1) (f_1 \pm f_2)(x) = f_1(x) \pm f_2(x)$$

$$\text{At } f_1 \pm f_2 : D_1 \cap D_2 \rightarrow R$$

$$2) (f_1 \times f_2)(x) = f_1(x) \times f_2(x)$$

$$\text{At } f_1 \times f_2 : D_1 \cap D_2 \rightarrow R$$

$$3) \left(\frac{f_1}{f_2}\right)(x) = \frac{f_1(x)}{f_2(x)}$$

$$\text{At } \frac{f_1}{f_2} : D_1 \cap D_2 - Z(f_2) \rightarrow R$$

S.t $Z(f_2)$ denoted to the set of zeroes of f_2

Secondly Composition of functions

$$(f \circ g)(x) = f[g(x)]$$

Note that

1) We apply the function g firstly, then we apply f

2) To find the domain of $(f \circ g)$ we follow

a) Find $D_1 = \text{domain of } g(x)$

b) Find $D_2 = \text{values of } x \text{ which makes } g(x) \text{ in the domain of } f(x)$

c) The domain of $(f \circ g) = D_1 \cap D_2$

Even function:

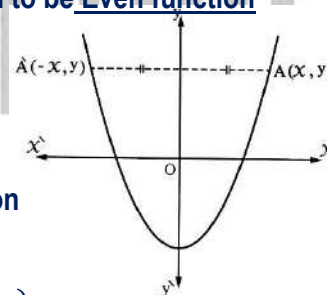
The function $f: x \rightarrow y$ is said to be Even function

$$\text{If } f(-x) = f(x)$$

The graph of the even function is symmetric about y-axis

I.e. if $(x, y) \in \text{graph of } f(x)$

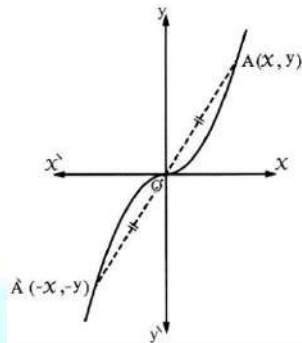
We find $(-x, y) \in \text{graph of } f(x)$



Odd function:

The function $f: x \rightarrow y$ is said to be Odd function

$$\text{If } f(-x) = -f(x)$$



The graph of the even function is symmetric about origin point

i.e. if $(x, y) \in \text{graph of } f(x)$

We find $(-x, -y) \in \text{graph of } f(x)$

Important remarks

1) The function may be neither even nor odd i.e.
 $f(-x) \neq f(x)$ and $f(-x) \neq -f(x)$

2) If the domain of the function is $R - \{a\}$, $a \neq 0$, then the function neither odd nor even

3) If the function is even and its curve passes through (a, b) , then the curve must pass through $(-a, b)$

4) If the function is odd and its curve passes through (a, b) , then the curve must pass through $(-a, -b)$

5) The zero function $f: f(x) = 0$ is an even and odd function at the same time

6) The function $f: R \rightarrow R$, $f(x) = ax^n$, where $a \neq 0$, $n \in Z^+$ is called the power function, and it is: Even when n is an even number and odd when n is an odd number

7) $\sin -x = -\sin x$ (odd function)

$\cos -x = \cos x$ (even function)

$\tan -x = -\tan x$ (odd function)

Even functions

$$f(x) = \cos x$$

$$f(x) = \sec x$$

Odd functions

$$f(x) = \sin x$$

$$f(x) = \csc x$$

$$f(x) = \tan x$$

$$f(x) = \cot x$$

8) If F_1 and F_2 are both even function and g_1 and g_2 are both odd function Then

a) $F_1 \pm F_2$ is an even function

b) $F_1 \times F_2$ and $F_1 \div F_2$ is an even function

c) $g_1 \pm g_2$ is an odd function

d) $g_1 \times g_2$ and $g_1 \div g_2$ is an even function

e) $F_1 \pm g_1$ is neither even nor odd

f) $F_1 \times g_1$ and $F_1 \div g_1$ is odd function

Remember

$$(+)\times(+)=+ \quad (-)\times(+)= -$$

$$(-)\times(-)=+ \quad (+)\times(-)= -$$

One-to-one function

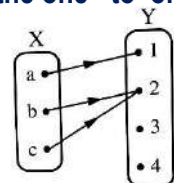
Def. The function $f: x \rightarrow y$ is said one-to-one if and only if

* $\forall a$ and $b \in X$ (domain of f)

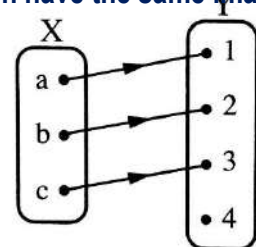
and $f(a) = f(b)$ we get $a = b$ or

* $\forall a$ and $b \in X$, $a \neq b$, then $f(a) \neq f(b)$

That is mean, there is no two elements in the domain of the one-to-one function have the same image



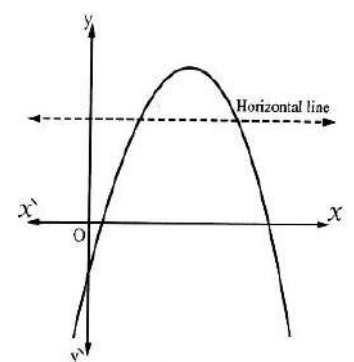
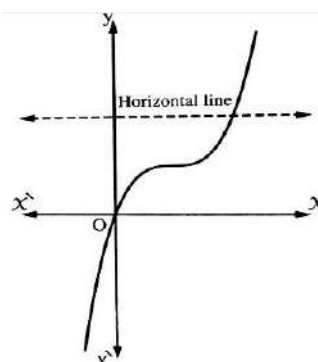
The function is not one-to-one from x to y



The function is one-to-one from x to y

The horizontal line test

If there exist a horizontal line [parallel to x-axis] intersect the curve of the function in more than one, then the curve does not represent the one-to-one function



Kinds of a polynomial

1)The constant function

*its standard form is $f(x) = a \quad \forall \quad a \in R$

2)The linear function (function first degree)

*its standard form is $f(x) = ax + b \quad s.t \quad a \neq 0$

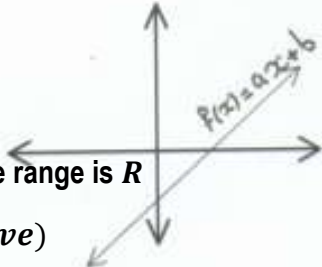
*Its graph is straight line

1) Whose slope is a

2) The domain of f is R and the range is R

3) f is increasing, if $a > 0$ (+ve)

4) f is decreasing, if $a < 0$ (-ve)



3)The quadratic function

It is a function of second degree, its standard form is

$$f(x) = ax^2 + bx + c \quad s.t \quad a \neq 0$$

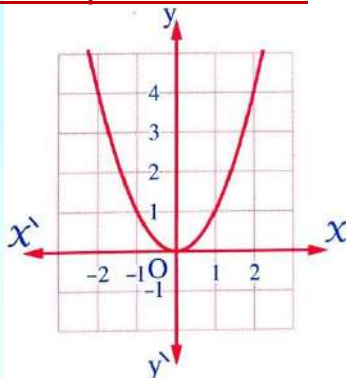
The graphical representation of the quadratic function

$$1) f(x) = x^2$$

$$*x - \text{of vertex} = \frac{-b}{2a}$$

$$*y - \text{of vertex} = f\left(\frac{-b}{2a}\right)$$

$$\text{The vertex} = \left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$$

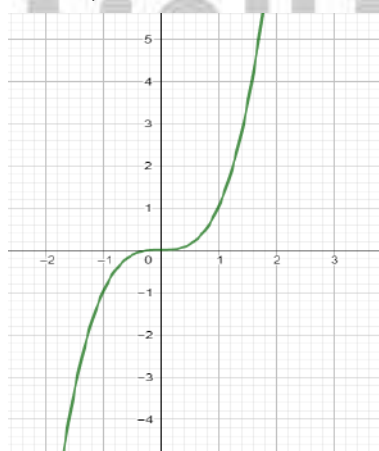


4)The cubic function

It is a function of third degree, its standard form is

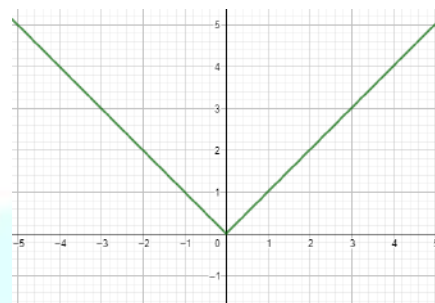
$$f(x) = ax^3 + bx^2 + cx + d, \text{ where } a \neq 0$$

$$1) f(x) = x^3$$



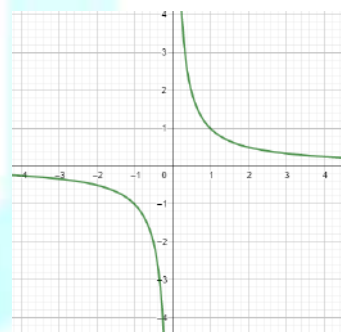
5)The graphical representation of the absolute value function

$$f(x) = |x| = \begin{cases} x & \text{when } x \geq 0 \\ -x & \text{when } x < 0 \end{cases}$$



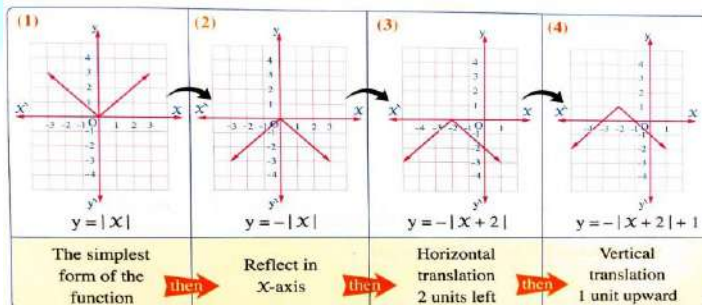
6)The fractional function $f(x) = \frac{1}{x-b}$

$$1) f(x) = \frac{1}{x}, \quad x \neq 0$$



$y = |x|$ we can get the curve of the function

$y = -|x + 2| + 1$ as follow



Important Remarks

*For every a polynomial function $f(x)$

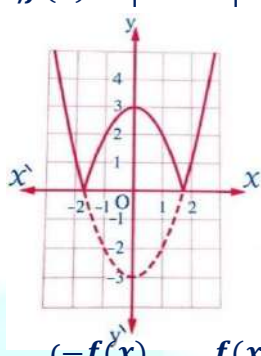
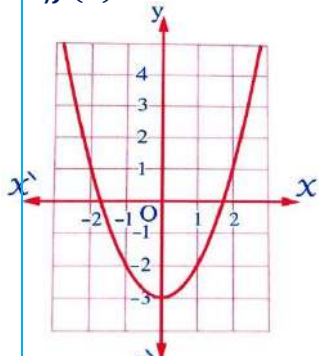
$$1) \text{The curve of } y = |f(x)| = \begin{cases} f(x) & , f(x) \geq 0 \\ -f(x) & f(x) < 0 \end{cases}$$

Is represented by the curve $y = f(x)$ with replacement the part of the curve under x - axis by its image by reflection on x - axis

Example:

1) $f(x) = x^2 - 3$

2) $f(x) = |x^2 - 3|$



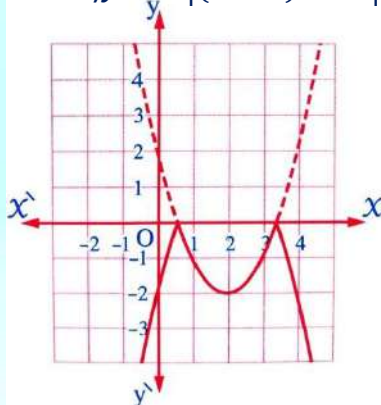
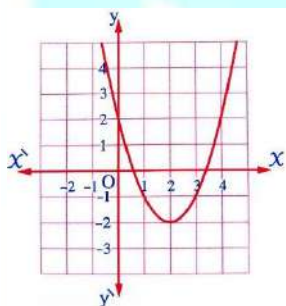
2) The curve of $y = -|f(x)| = \begin{cases} -f(x) & , f(x) \geq 0 \\ f(x) & f(x) < 0 \end{cases}$

Is represented by the curve $y = f(x)$ with replacement the part of the curve above x -axis by its image by reflection on x -axis

Example

1) $y = (x - 2)^2 - 2$

2) $y = -|(x - 2)^2 - 2|$



Solving absolute value equations and inequalities

Definition: if $x \in \mathbb{R}$, then $|x|$ is called the absolute value of x and is denoted by

$$|x| = \begin{cases} x & \text{when } x \geq 0 \\ -x & \text{when } x < 0 \end{cases}$$

e.g. $|-5| = 5$, $|5| = 5$, $|0| = 0$

The properties of the absolute value function

1) $|a| \geq 0$

2) $|ab| = |a| \times |b|$

3) $|a + b| \leq |a| + |b|$

4) $\sqrt{x^2} = |x|$

5) $|x|^2 = x^2$

6) $|a - x| = |x - a|$

7) $|x| = a \rightarrow x = a \text{ or } x = -a$

8) $|x| = |a| \rightarrow x = a \text{ or } x = -a$

How Solve the equation algebraically

1) $|ax + b| = c$, $c \in [0, \infty[$

a) Using definition b) inside the absolute sign = $\pm c$

ex $|x - 2| = 3$

$x - 2 = \pm 3$

$x - 2 = 3$ or $x - 2 = -3$

$x = 5$ or $x = -1$ The S.S = $\{-1, 5\}$

2) $|ax + b| = c$, $c \in]-\infty, 0[$

The S.S = $\emptyset$

3) $|ax + b| = |cx + d|$

a) One of the two expressions = $\pm$ the other expression

b) By squaring the two sides of the equation

$|x - 4| = |2x - 5|$

First

$x - 4 = \pm(2x - 5)$

$x - 4 = 2x - 5$ or $x - 4 = -2x + 5$

$x - 2x = -5 + 4$ or $x + 2x = 5 + 4$

$-x = -1$ or $3x = 9$

$x = 1$ or $x = 3$ The S.S = $\{1, 3\}$

Second

$(x - 4)^2 = (2x - 5)^2$

$x^2 - 8x + 16 = 4x^2 - 20x + 25$

$3x^2 - 12x + 9 = 0$ $x = 3$ or $x = 1$ The S.S = $\{1, 3\}$

4) $|ax + b| = cx + d$

Using the definition to redefine the absolute to get the two equation

$$ax + b = cx + d \quad \text{at } x \geq \frac{-b}{a} \quad \text{or}$$

$$ax + bx = -cx - d \quad \text{at } x < \frac{-b}{a}$$

Ex $|x - 2| = x + 4$

put $x - 2 = 0$ then $x = 2$ Check V.I

At $x \geq 2$

$$x - 2 = x + 4$$

$$-2 = 4 \text{ ref}$$

at $x < 2$

$$x - 2 = -x - 4$$

$$x + x = 2 -$$

$$x = -1 \in] -\infty, 2[$$

The S.S = $\{-1\}$

How Solve inequalities algebraically

For each $a \in \mathbb{R}^+$

1) If $|x| < a$

then $-a < x < a$

$$x \in] -a, a[$$

2) if $|x| \leq a$

then $-a \leq x \leq a$

$$x \in [-a, a]$$

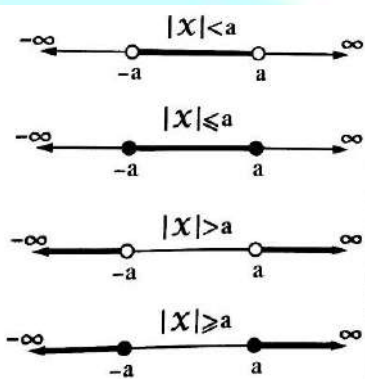
3) If $|x| > a$

then $x > a$ or $x < -a$ then $x \in \mathbb{R} - [-a, a]$

4) If $|x| \geq a$

then $x \geq a$ or $x \leq -a$

$$x \in \mathbb{R} -] -a, a[$$



How Solve equation and inequalities graphically

1) The S.S of the equation

$$f(x) = g(x) \text{ is } \{a, b\}$$

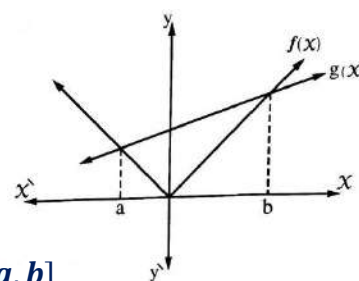
2) The S.S of the inequality

a) $f(x) < g(x)$ is $]a, b[$

b) $f(x) \leq g(x)$ is $[a, b]$

c) $f(x) > g(x)$ is $\mathbb{R} - [a, b]$

d) $f(x) \geq g(x)$ is $\mathbb{R} -]a, b[$



Special cases

1) $|x - 2| > -1 \rightarrow S.S = \mathbb{R}$

$\rightarrow S.S = \mathbb{R}$

2) $|x - 2| > 0 \rightarrow S.S = \mathbb{R} - \{2\}$

$\rightarrow S.S = \mathbb{R} - \{2\}$

3) $|x - 2| \geq 0 \rightarrow S.S = \mathbb{R}$

$\rightarrow S.S = \mathbb{R}$

4) $|x - 2| < 0 \rightarrow S.S = \emptyset$

$\rightarrow S.S = \emptyset$

5) $|x - 2| < -2 \rightarrow S.S = \emptyset$

$\rightarrow S.S = \emptyset$

6) $|x - 2| \leq 0$

$$x - 2 = 0$$

$$x = 2$$

$$S.S = \{2\}$$

$$7) |x| = \begin{cases} x & , x > 0 \\ -x & , x < 0 \end{cases}$$

8) $|x| - x = 0$

$$S.S = [0, \infty[$$

9) $|x| + x = 0$

$$x \geq 0$$

$$x < 0$$

$$x + x = 0$$

$$-x + x = 0$$

$$2x = 0$$

$$0 = 0$$

this is satisfying for any value of $x < 0$

$$x = 0$$

$$S.S =] -\infty, 0]$$

10) $|x - 2| = x - 2 \rightarrow S.S = [2, \infty[$

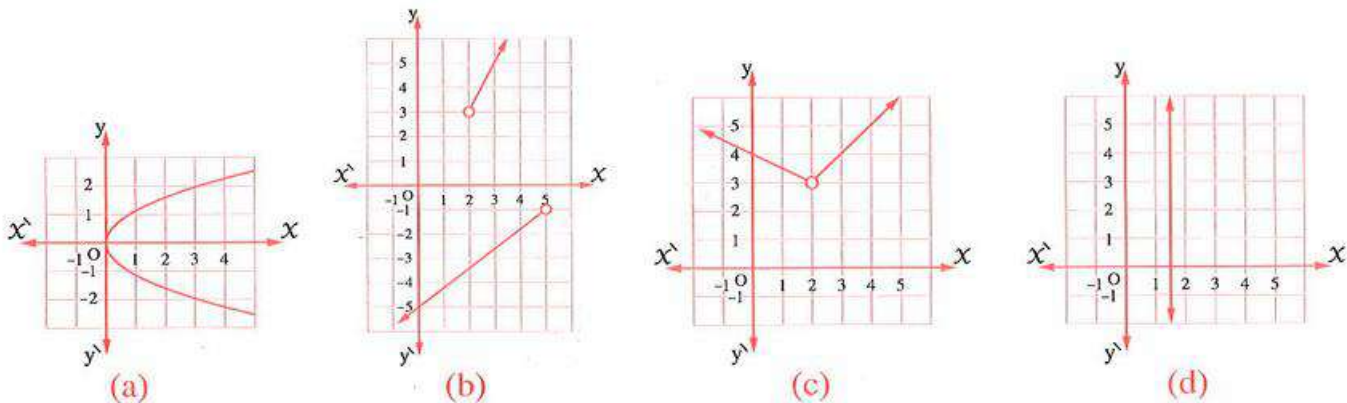
11) $|x - 2| = 2 - x \rightarrow S.S =] -\infty, 2]$

Second Multiple choice questions

1) All the following relations are not functions except

- (a) $x = y^2 + 1$ (b) $y = x^2 - 1$
 (c) $x^2 + xy + y^2 = 3$ (d) $\{(1, 2), (2, 1), (1, 3), (-1, 4)\}$

2) The figure which represents function of x from the following figures is



3) The domain of the function $f : f(x) = 5$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\{5\}$ (d) $\{0, 5\}$

4) If the domain of the function $f : f(x) = \frac{2}{x^2 - 6x + k}$ is $\mathbb{R} - \{3\}$, then $k =$

- (a) 3 (b) 9 (c) ± 9 (d) 18

5) The domain of the function $f : f(x) = \sqrt{x - 3}$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{3\}$ (c) $[3, \infty[$ (d) $]-\infty, 3[$

6) The domain of the function f where $f(x) = \sqrt[4]{x^2 + 4}$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{4\}$ (c) $\mathbb{R} - \{0\}$ (d) $\mathbb{R} - \{-2, 2\}$

7) The domain of the function : $f(x) = \sqrt{x^2 - 6x + 9}$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \{-3\}$ (d) $\mathbb{R} - [-3, 3]$

8)  The domain of the function f where $f(x) = \frac{1}{\sqrt[3]{x^2 - 5x - 6}}$ is

- (a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} - \{6\}$ (c) $\mathbb{R} - \{1, -6\}$ (d) $\mathbb{R} - \{-1, 6\}$

9) If the domain of the function $f : f(x) = \frac{1}{\sqrt{x-a}}$ is $] -3, \infty[$, then $a = \dots\dots\dots$

- (a) 3 (b) -3 (c) ± 3 (d) $\sqrt{3}$

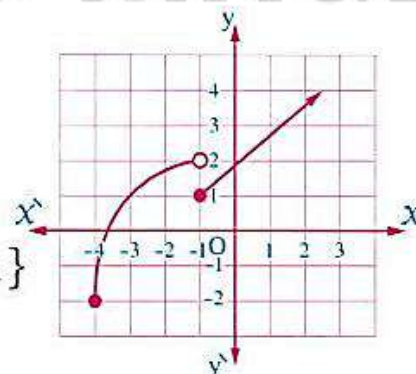
10) The domain of the function f where $f(x) = \begin{cases} x & , & 0 \leq x \leq 1 \\ 2-x & , & 1 < x \leq 2 \end{cases}$ is

- (a) $\mathbb{R} - \{1\}$ (b) $[0, 2]$ (c) $\mathbb{R} - \{0, 2\}$ (d) $]0, 2[$

MR. MOHAMED MAGD

11) The opposite figure represents the curve of function f , then its domain is

- (a) $\mathbb{R} - \{-4, -1\}$ (b) $] -4, -1[$
(c) $[-4, \infty[$ (d) $[-4, \infty[- \{-1\}$



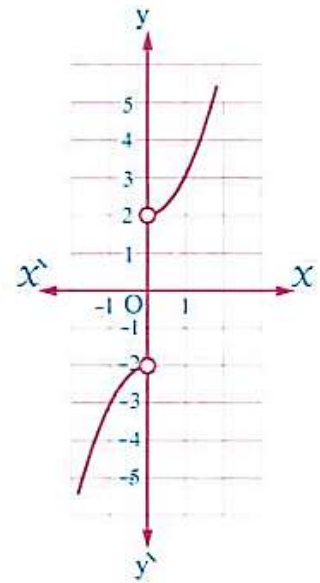
12) In the opposite figure :

First : The range of the function is

- (a) $\mathbb{R} - \{0\}$ (b) $\mathbb{R} - [-2, 2]$
 (c) $\mathbb{R}$ (d) $[-2, 2]$

Second : The function is increasing in

- (a) $] -\infty, 0[$ only
 (b) $] 0, \infty[$ only
 (c) $] -\infty, 0[,] 0, \infty[$
 (d) $\mathbb{R} - [-2, 2]$



13) If $f(x) = \sqrt[3]{x-1}$, $g(x) = \sqrt{x-1}$, then the domain of $(f - g)$ is

- (a) $[-1, \infty[$ (b) $[1, \infty[$ (c) $\mathbb{R}$ (d) $] -\infty, 1]$

14) The domain of the function $f : f(x) = \frac{x-5}{\sqrt{2x-3}}$ is

- (a) $\mathbb{R} - \{5\}$ (b) $] \frac{3}{2}, \infty[$ (c) $] \frac{3}{2}, \infty[- \{5\}$ (d) $\mathbb{R} - \{\frac{3}{2}\}$

15) If : $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$

- (a) 7 (b) 3 (c) 4 (d) 9

16) If $f(x) = x - 3$, $g(x) = x^2$, then $(f \circ g)(x) = \dots\dots\dots$

- (a) $(x - 3)^2$ (b) $x^2 - 3$ (c) $x^2 + 3$ (d) $\sqrt{x - 3}$

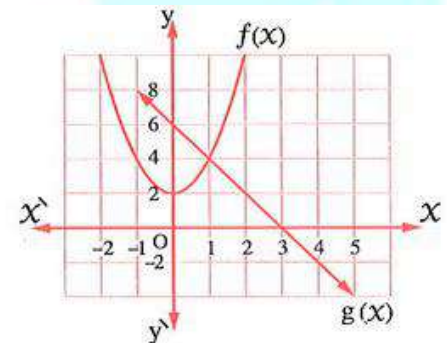
17) If the relation between x , $f(x)$
 , $g(x)$ is as given in the opposite table
 , then $g(f(6)) = \dots\dots\dots$

x	$f(x)$	x	$g(x)$
-3	4	-4	3
-2	3	-1	1
3	1	1	-4
6	-1	4	-7

- (a) 3 (b) 1
 (c) -4 (d) -7

18) The opposite figure :

Represents the curves of the two functions
 f and g , then $(g \circ f)(1) = \dots\dots\dots$



- (a) 6 (b) 5
 (c) -2 (d) 4

19) The even function from the functions that are defined by the following rules is

- (a) $f(x) = x^3$ (b) $f(x) = \sin x$
 (c) $f(x) = x \cos x$ (d) $f(x) = x \sin x$

19) The function $f : f(x) = x \cos x$ is

- (a) even. (b) odd.
 (c) neither even nor odd. (d) one - to - one.

20) If f is an odd function, $a \in$ the domain of f , then $f(a) + f(-a) = \dots\dots\dots$

- (a) zero. (b) $2f(a)$ (c) $2a$ (d) $f(a)$

21) The function $f : f(x) = (x + \sin x) (\dots\dots\dots)$ is even.

- (a) $x^3 + \tan x$ (b) $1 + \sin x$ (c) $4 - x^2$ (d) $x - \cos x$

22)  If the function f is an even over $[a, b]$, then $b = \dots\dots\dots$

- (a) a (b) $-a$ (c) $2a$ (d) a^3

23) If f is a function where $f :]-5, 5] \longrightarrow \mathbb{R}$, $f(x) = x^2$, then the function $f(x)$ is $\dots\dots\dots$

- (a) even. (b) odd.
(c) one - to - one. (d) neither odd nor even.

24) If f is an even function and $f(x) + x^2 f(-x) = 3$, then $f(1) = \dots\dots\dots$

- (a) 1 (b) $\frac{1}{4}$ (c) $\frac{3}{2}$ (d) 2

25) The one - to - one function from those defined by the following rules is $\dots\dots\dots$

- (a) $f(x) = 3 - x^2$ (b) $f(x) = x^3 + 3$
(c) $f(x) = \sin x \tan x$ (d) $f(x) = x^2 + x$

26) If f , g are two functions where $f(x) = x^3$, $g(x) = x + 2$, then $(g \circ f)$ is function.

- (a) a one - to - one (b) an odd (c) an even (d) a linear

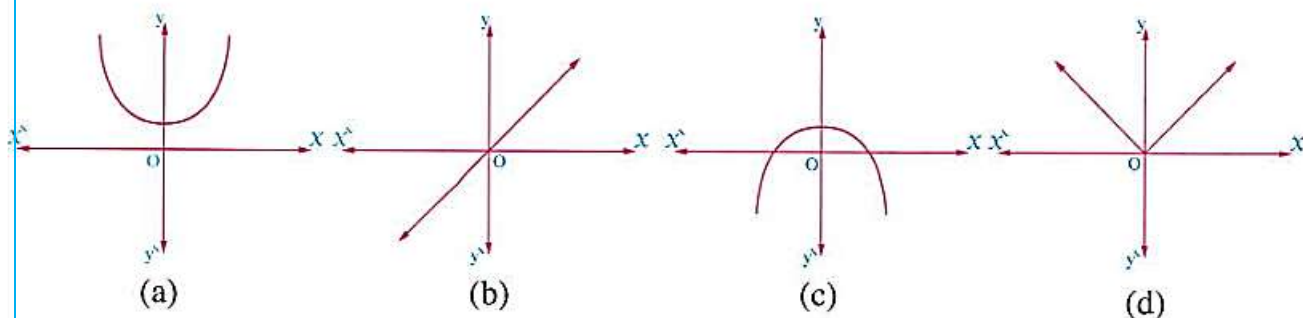
27) If f is one-to-one and $f(k^2 + 4) = f(4k)$, then $k = \dots\dots\dots$

- (a) -2 (b) 2 (c) -4 (d) 4

28) If f is an odd function and $f(1) = 2$, the point $(-1, 3m + 7)$ lies on the curve of the function f , then $m = \dots\dots\dots$

- (a) -3 (b) 3 (c) $\frac{5}{3}$ (d) $-\frac{5}{3}$

29) Which of the following represents one - to - one function ?



30) The range of the function $f : f(x) = \frac{x^2 - 3x}{x}$ where $x \neq 0$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\{0\}$ (d) $\mathbb{R} - \{-3\}$

31) The range of the function $f : f(x) = \begin{cases} x & , x > 0 \\ -2 & , x \leq 0 \end{cases}$ is

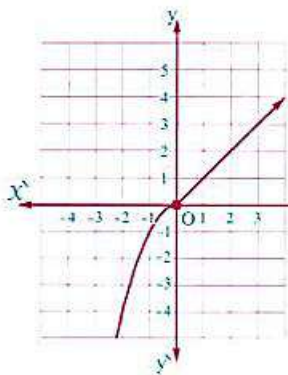
(a) $\mathbb{R}^+$

(b) $\mathbb{R}^+ - \{-2\}$

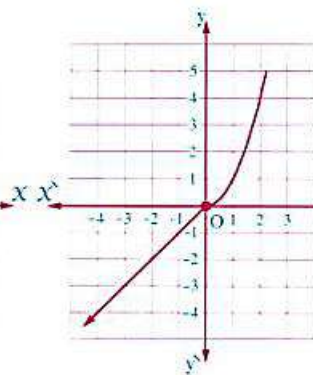
(c) $\mathbb{R}^+ \cup \{-2\}$

(d) $\mathbb{R}$

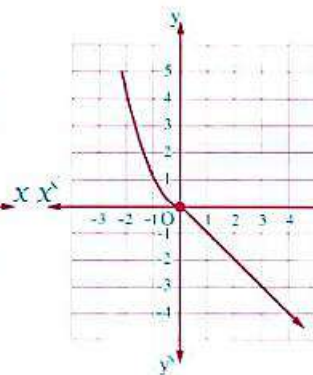
32) The curve of the function $f : f(x) = \begin{cases} x^2 & , x > 0 \\ x & , x \leq 0 \end{cases}$ is



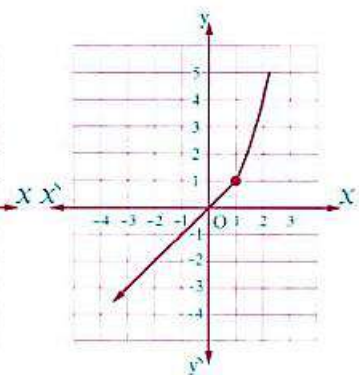
(a)



(b)

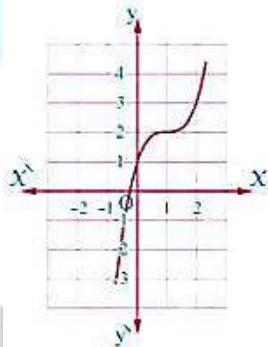


(c)

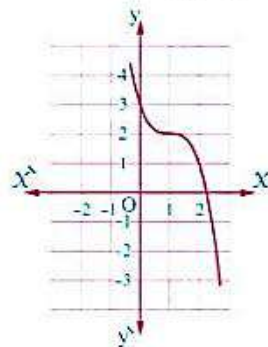


(d)

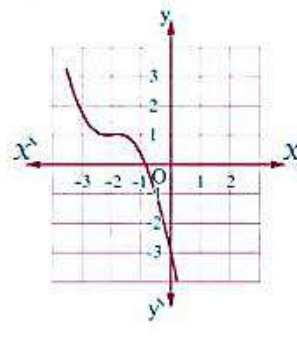
33) If $f(x) = 2 - (x - 1)^3$, then the graph that represents the function f is



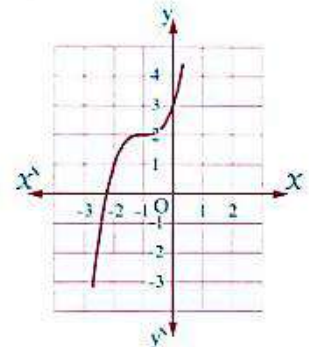
(a)



(b)



(c)



(d)

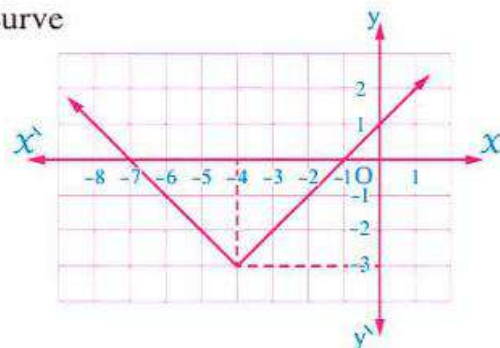
34) Which of the following function rules represents the curve in the given figure ?

(a) $f(x) = |x - 4| - 3$

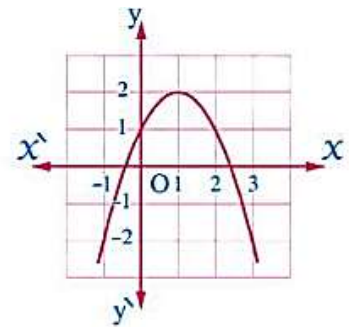
(b) $f(x) = |x - 4| + 3$

(c) $f(x) = |x + 4| - 3$

(d) $f(x) = |x + 4| + 3$



35) Which of the following function rules is represented in the given figure ?



- (a) $f(x) = (x - 1)^2 + 2$ (b) $f(x) = 1 - (x - 2)^2$
 (c) $f(x) = 2 - (x - 1)^2$ (d) $f(x) = (x + 1)^2 - 2$

36) The symmetric point of the function $f : f(x) = \frac{x+1}{x}$ is

- (a) (1, 0) (b) (0, 1) (c) (0, 0) (d) (1, -1)

37) The vertex of the curve of the function $f : f(x) = |x + 3| - 2$ is

- (a) (3, 2) (b) (-3, -2) (c) (-3, 2) (d) (3, -2)

38) The function f where $f(x) = \frac{2x-1}{x-1}$ is decreasing on the interval

- (a) $]-\infty, 1]$ (b) $]-\infty, 1[,]1, \infty[$
 (c) $[1, \infty[$ (d) $]-\infty, 2[,]2, \infty[$



MR. MOHAMED MAGD

39) The range of the function $f : f(x) = 2 - \frac{3}{x-1}$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{1\}$ (c) $\mathbb{R} - \{2\}$ (d) $\mathbb{R} - \{3\}$

40) The range of the function $f : f(x) = |4 - x|$ is

(a) $\mathbb{R}^+$

(b) $\mathbb{R}$

(c) $[0, \infty[$

(d) $]-\infty, 0]$

41) If the curve $y = f(x)$ represents a real function then its image by translation 5 units vertically downward is the same as $g(x) = \dots\dots\dots$

(a) $f(x - 5)$

(b) $f(x + 5)$

(c) $f(x) + 5$

(d) $f(x) - 5$

42) If f is a real function whose domain is $[-2, 3]$, then the domain of $g : g(x) = f(x - 2)$ is

(a) $[-2, 3]$

(b) $[-4, 1]$

(c) $[0, 5]$

(d) $\mathbb{R}$

43) If the curve $f(x) = -x^3$ moves 4 units to the left and 2 units upwards to become the curve $g(x)$, then $g(-2) = \dots\dots\dots$

(a) -218

(b) 214

(c) 6

(d) -6

44) The curve of the function $g : g(x) = x$ is the same as the curve of the function $f : f(x) = \dots\dots\dots$ by reflection in the x -axis.

(a) x

(b) $-x$

(c) $x + 1$

(d) $-x + 1$

45) The range of the function f where $f(x) = -|x^3|$ is

- (a) $\mathbb{R}$ (b) $[0, \infty[$ (c) $] -\infty, 0]$ (d) $\mathbb{R} - \{0\}$

46) The solution set of the equation $|x - 3| = 5$ in $\mathbb{R}$ is

- (a) $\{3, 5\}$ (b) $\{-2, 8\}$ (c) $[-2, 8]$ (d) $\{-8, 8\}$

47) The solution set of the equation $|x - 3| = |3 - x|$ in $\mathbb{R}$ is

- (a) $\{3\}$ (b) $\{3, -3\}$ (c) $\mathbb{R}$ (d) $\emptyset$

48) The solution set of the equation : $|x - 3| = 2x + 9$ in $\mathbb{R}$ is

- (a) $\{-11\}$ (b) $\{-2\}$ (c) $\{-2, -11\}$ (d) $\emptyset$

49) The solution set of the inequality $|x - 2| \leq -4$ in $\mathbb{R}$ is

- (a) $] -2, 6[$ (b) $[-2, 6]$ (c) $\mathbb{R}$ (d) $\emptyset$

50) The solution set of the inequality : $|x - 2| > 3$ is

- (a) $\mathbb{R} - [-1, 5]$ (b) $\mathbb{R} -]-1, 5[$ (c) $[-1, 5]$ (d) $]-1, 5[$

51) The solution set of the inequality : $|2 - x| \leq 4$ is

- (a) $\mathbb{R} - [-2, 6]$ (b) $\mathbb{R} -]-2, 6[$ (c) $]-2, 6[$ (d) $[-2, 6]$

52) The solution set of the inequality : $\frac{1}{|x - 2|} \geq \frac{1}{2}$ in $\mathbb{R}$ is

- (a) $]0, 4[$ (b) $[0, 4] - \{2\}$ (c) $[0, 4]$ (d) $]0, 4]$

MR. MOHAMED MAGD

53) The solution set of the inequality : $|2x - 3| + |6 - 4x| \leq 21$ is

- (a) $[-2, 5]$ (b) $\mathbb{R} -]-2, 5[$ (c) $] -2, 5[$ (d) $\{-2, 5\}$

54) The solution set of the inequality : $\sqrt{x^2 - 2x + 1} \geq 4$ in $\mathbb{R}$ is

- (a) $[-3, 5]$ (b) $\mathbb{R} -]-3, 5[$ (c) $] -3, 5[$ (d) $\mathbb{R} - [-3, 5]$

55) The solution set of the equation : $|x| = -x$ in $\mathbb{R}$ is

- (a) $\emptyset$ (b) $\mathbb{R}$ (c) $\mathbb{R}^-$ (d) $] -\infty, 0]$

56) If $f(x) = x|x + 2| + 3$, $f(m - 1) = 6$, then $m =$

- (a) -2 (b) 2 (c) $\sqrt{2}$ (d) $-\sqrt{2}$

57) The domain of the function $f(x) = \frac{2}{|x|-2}$ is

- (a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{2, -2\}$

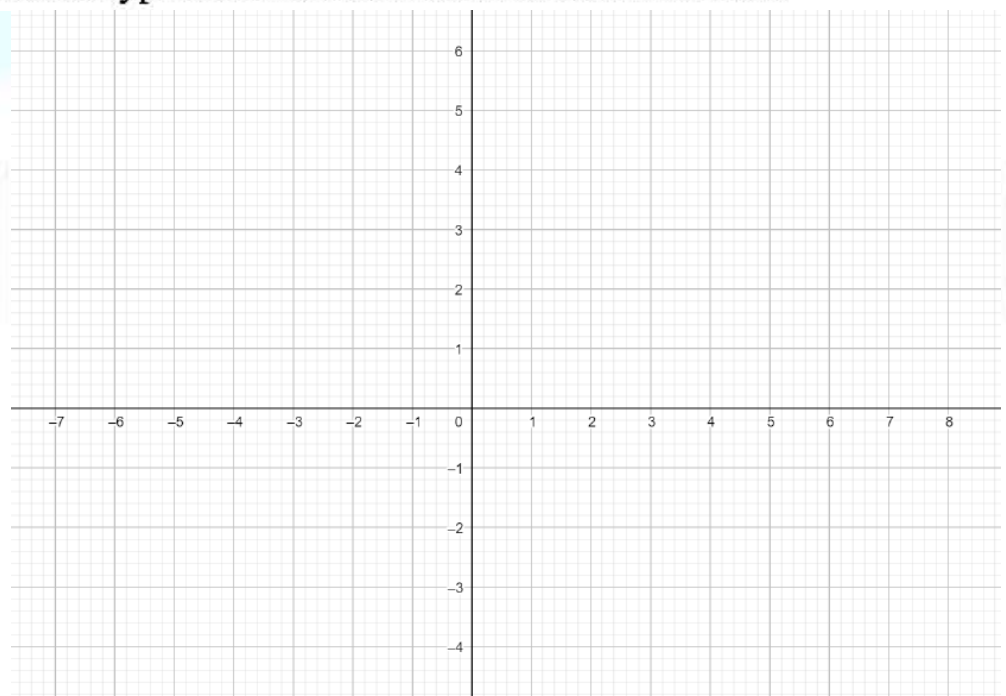
58) The absolute value inequality that represents that the score of a student in one test (x) is including between 70 to 90 is

- (a) $|x| \leq 90$ (b) $|x| \geq 70$ (c) $|x - 80| \leq 10$ (d) $|x - 70| \leq 90$

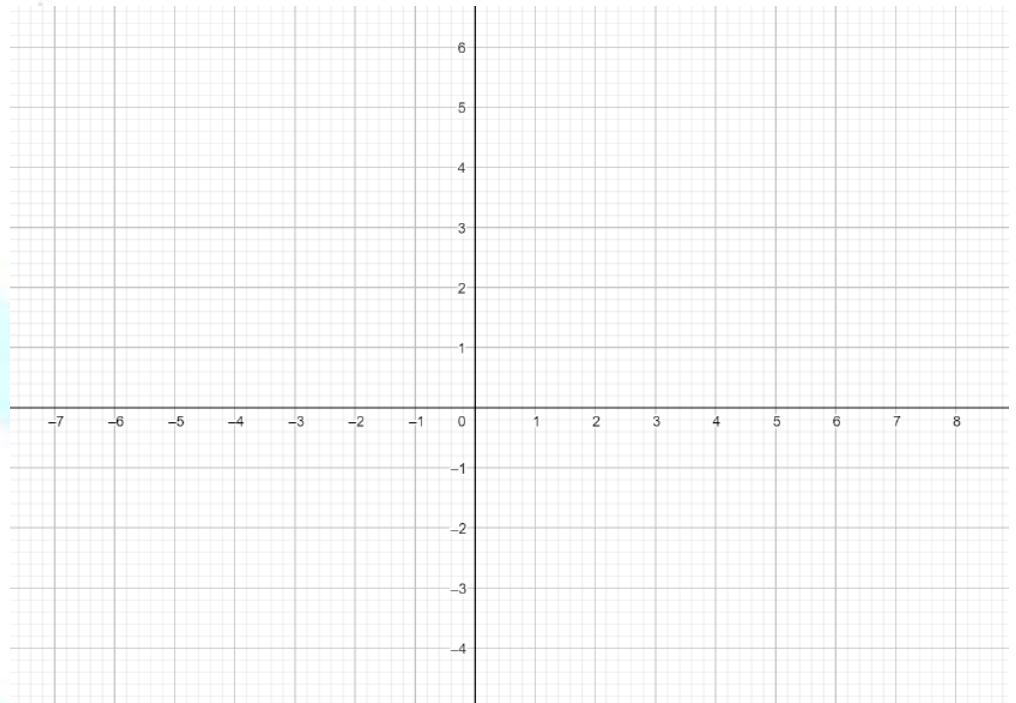
Essay questions

59) Determine the type of the function defined by the following rule , whether it is even , odd or otherwise $f(x) = 3x - 4x^3$

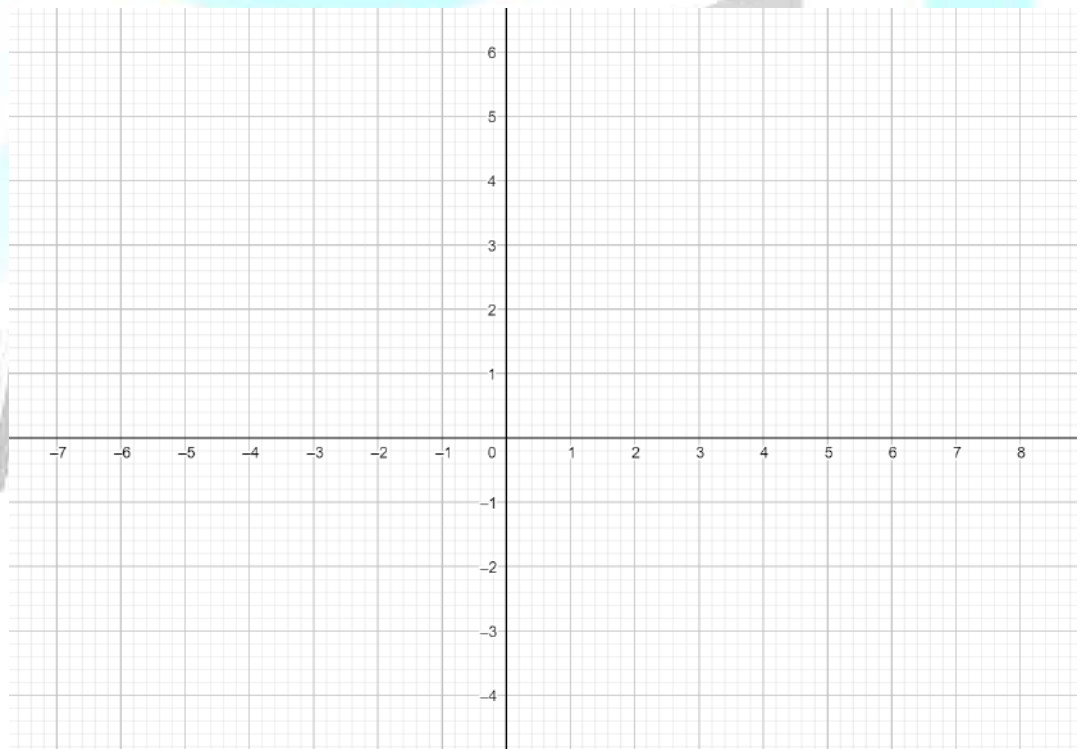
60) Graph the function $f(x) = (x - 1)^2$, from the graph find the range of the function , then determine its monotony and its type whether it is even , odd or otherwise.



61) Represent the function $f(x) = (x - 2)^3 + 1$ graphically, then from the graph find the domain, its type if it is even, odd or otherwise



61) Draw the curve of the function $f(x) = |x - 2|$ and determine its range and type whether it is even, odd or otherwise.



Second Multiple choice questions

1) All the following relations are not functions except

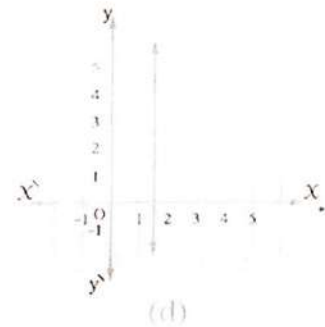
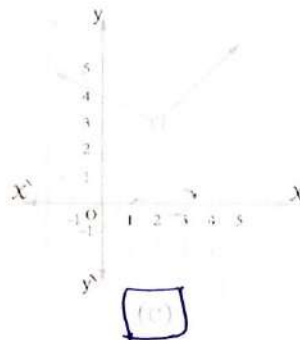
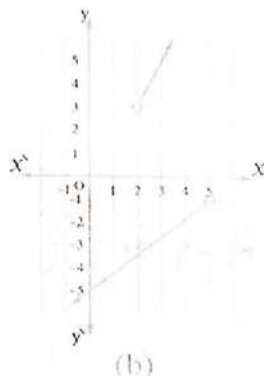
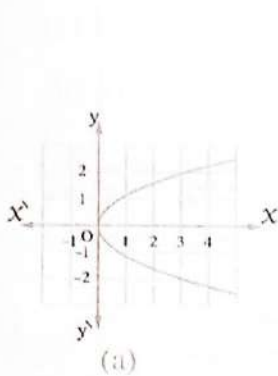
(a) $X = y^2 + 1$

(b) $y = X^2 - 1$

(c) $X^2 + Xy + y^2 = 3$

(d) $\{(1, 2), (2, 1), (1, 3), (-1, 4)\}$

2) The figure which represents function of X from the following figures is



3) The domain of the function $f : f(X) = 5$ is

(a) $\mathbb{R}$

(b) $\mathbb{R}^+$

(c) $\{5\}$

(d) $\{0, 5\}$

4) If the domain of the function $f : f(X) = \frac{2}{X^2 - 6X + k}$ is $\mathbb{R} - \{3\}$, then $k = \dots$

(a) 3

(b) 9

(c) ± 9

(d) 18

at $x=3$ $9x^2 - 6x + k = 0$
 $9 - 18 + k = 0$
 $-9 + k = 0$
 $k = 9$

5) The domain of the function $f : f(X) = \sqrt{X-3}$ is

(a) $\mathbb{R}$

(b) $\mathbb{R} - \{3\}$

(c) $[3, \infty[$

(d) $]-\infty, 3[$

$x-3 \geq 0$
 $x \geq 3$

Domain = $[3, \infty[$

6) The domain of the function f where $f(X) = \sqrt[4]{X^2 + 4}$ is

(a) $\mathbb{R}$

(b) $\mathbb{R} - \{4\}$

(c) $\mathbb{R} - \{0\}$

(d) $\mathbb{R} - \{-2, 2\}$

$x^2 + 4 \geq 0$
 $x^2 + 4 = 0$
 has no real roots

$\leftarrow + + + + \rightarrow$
 Domain = $\mathbb{R}$

7) The domain of the function : $f(x) = \sqrt{x^2 - 6x + 9}$ is (d) $\mathbb{R} - [-3, 3]$

(a) $\mathbb{R}$

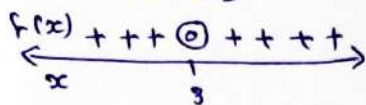
(b) $\mathbb{R} - \{3\}$

(c) $\mathbb{R} - \{-3\}$

$$x^2 - 6x + 9 \geq 0$$

$$x^2 - 6x + 9 = 0$$

$$x = 3$$



Domain = $\mathbb{R}$

8) The domain of the function f where $f(x) = \frac{1}{\sqrt[3]{x^2 - 5x - 6}}$ is

(a) $\mathbb{R} - \{5\}$

(b) $\mathbb{R} - \{6\}$

(c) $\mathbb{R} - \{1, -6\}$

(d) $\mathbb{R} - \{-1, 6\}$

$$x^2 - 5x - 6 = 0$$

$$x = 6 \quad x = -1$$

Domain = $\mathbb{R} - \{6, -1\}$

9) If the domain of the function $f : f(x) = \frac{1}{\sqrt{x-a}}$ is $] -3, \infty[$, then $a = \dots$

(a) 3

(b) -3

(c) ± 3

(d) $\sqrt{3}$

$$x - a > 0$$

$$x > a$$

$$]a, \infty[=] -3, \infty[$$

$$a = -3$$

10) The domain of the function f where $f(x) = \begin{cases} x & , 0 \leq x \leq 1 \\ 2-x & , 1 < x \leq 2 \end{cases}$ is

(a) $\mathbb{R} - \{1\}$

(b) $[0, 2]$

(c) $\mathbb{R} - \{0, 2\}$

(d) $]0, 2[$

$$\text{Domain}_1 = [0, 1]$$

$$\text{Domain}_2 =]1, 2]$$

$$\text{Domain} = D_1 \cup D_2 = [0, 2]$$

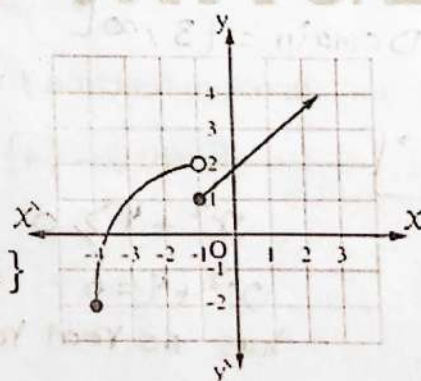
11) The opposite figure represents the curve of function f , then its domain is

(a) $\mathbb{R} - \{-4, -1\}$

(b) $] -4, -1[$

(c) $[-4, \infty[$

(d) $[-4, \infty[- \{-1\}$



In the opposite figure :

First : The range of the function is

(a) $\mathbb{R} - \{0\}$

(b) $\mathbb{R} - [-2, 2]$

(c) $\mathbb{R}$

(d) $[-2, 2]$

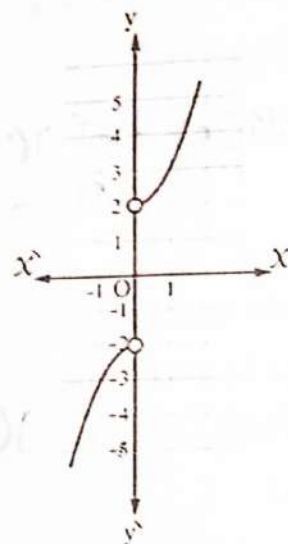
Second : The function is increasing in

(a) $]-\infty, 0[$ only

(b) $]0, \infty[$ only

(c) $]-\infty, 0[\cup]0, \infty[$

(d) $\mathbb{R} - [-2, 2]$



13) If $f(x) = \sqrt[3]{x-1}$, $g(x) = \sqrt{x-1}$, then the domain of $(f-g)$ is

(a) $[-1, \infty[$

(b) $[1, \infty[$

(c) $\mathbb{R}$

(d) $]-\infty, 1]$

$D_1 = \mathbb{R}$

$D_2 \Rightarrow x-1 \geq 0$

$x \geq 1$

$D_2 = [1, \infty[$

Domain of $(f-g)$

$= D_1 \cap D_2$

$= \mathbb{R} \cap [1, \infty[$

$= [1, \infty[$

14) The domain of the function $f : f(x) = \frac{x-5}{\sqrt{2x-3}}$ is

(a) $\mathbb{R} - \{5\}$

(b) $]\frac{3}{2}, \infty[$

(c) $[\frac{3}{2}, \infty[- \{5\}$

(d) $\mathbb{R} - \{\frac{3}{2}\}$

$2x-3 > 0$

$2x > 3$

$x > \frac{3}{2}$

Domain = $]\frac{3}{2}, \infty[$

15) If: $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$

(a) 7

(b) 3

(c) 4

(d) 9

$f \circ g(2) = f[g(2)]$

$= \sqrt{x^2+5} = \sqrt{2^2+5} = 3$

16) If $f(x) = x - 3$, $g(x) = x^2$, then $(f \circ g)(x) = \dots\dots\dots$

(a) $(x - 3)^2$

(b) $x^2 - 3$

(c) $x^2 + 3$

(d) $\sqrt{x - 3}$

$$f \circ g(x) = f[g(x)]$$

$$= x^2 - 3$$

17) If the relation between x , $f(x)$

, $g(x)$ is as given in the opposite table

, then $g(f(6)) = \dots\dots\dots = 1$

(a) 3

(b) 1

(c) -4

(d) -7

x	$f(x)$	x	$g(x)$
-3	4	-4	3
-2	3	-1	1
3	1	1	-4
6	-1	4	-7

18) The opposite figure :

Represents the curves of the two functions

f and g , then $(g \circ f)(1) = \dots\dots\dots$

$$= g(f(1))$$

$$= g(4)$$

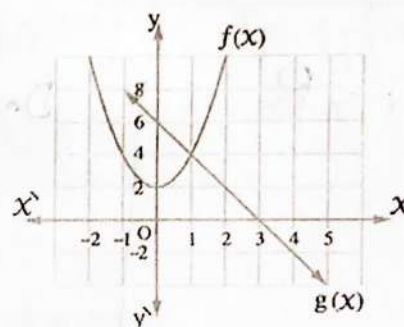
$$= -2$$

(a) 6

(b) 5

(c) -2

(d) 4



19) The even function from the functions that are defined by the following rules is

(a) $f(x) = x^3$ odd

(b) $f(x) = \sin x$ odd

(c) $f(x) = x \cos x$ odd

(d) $f(x) = x \sin x$ even

*

19) The function $f : f(x) = x \cos x$ is

(a) even.

(b) odd.

(c) neither even nor odd.

(d) one - to - one.

20) If f is an odd function, $a \in$ the domain of f , then $f(a) + f(-a) = \frac{f(a) - f(a)}{0} = 0$

(a) zero.

(b) $2f(a)$

(c) $2a$

(d) $f(a)$

21) The function $f: f(x) = (x + \sin x)$ (odd odd) is even.

(a) $x^3 + \tan x$

(b) $1 + \sin x$

(c) $4 - x^2$

(d) $x - \cos x$

22) If the function f is an even over $[a, b]$, then $b = \dots\dots\dots$

(a) a

(b) $-a$

(c) $2a$

(d) a^3

23) If f is a function where $f:]-5, 5] \rightarrow \mathbb{R}$, $f(x) = x^2$, then the function $f(x)$ is $\dots\dots\dots$

(a) even.

(b) odd.

(c) one - to - one.

(d) neither odd nor even.

24) If f is an even function and $f(x) + x^2 f(-x) = 3$, then $f(1) = \dots\dots\dots$

(a) 1

(b) $\frac{1}{4}$

(c) $\frac{3}{2}$

(d) 2

$$f(x) + x^2 f(x) = 3$$

$$f(1) + 1f(1) = 3$$

$$2f(1) = 3$$

$$f(1) = \frac{3}{2}$$

25) The one - to - one function from those defined by the following rules is $\dots\dots\dots$

(a) $f(x) = 3 - x^2$

(b) $f(x) = x^3 + 3$

(c) $f(x) = \sin x \tan x$

(d) $f(x) = x^2 + x$

26) If f, g are two functions where $f(x) = x^3$, $g(x) = x + 2$, then $(g \circ f)$ is function. $g \circ f(x) = g[f(x)] = x^3 + 2$

- (a) a one - to - one (b) an odd (c) an even (d) a linear

27) If f is one-to-one and $f(k^2 + 4) = f(4k)$, then $k = \dots\dots\dots$

- (a) -2 (b) 2 (c) -4 (d) 4

$$k^2 + 4 = 4k$$

$$k^2 - 4k + 4 = 0$$

$$(k-2)^2 = 0$$

$$k = 2$$

28) If f is an odd function and $f(1) = 2$, the point $(-1, 3m + 7)$ lies on the curve of the function f , then $m = \dots\dots\dots$

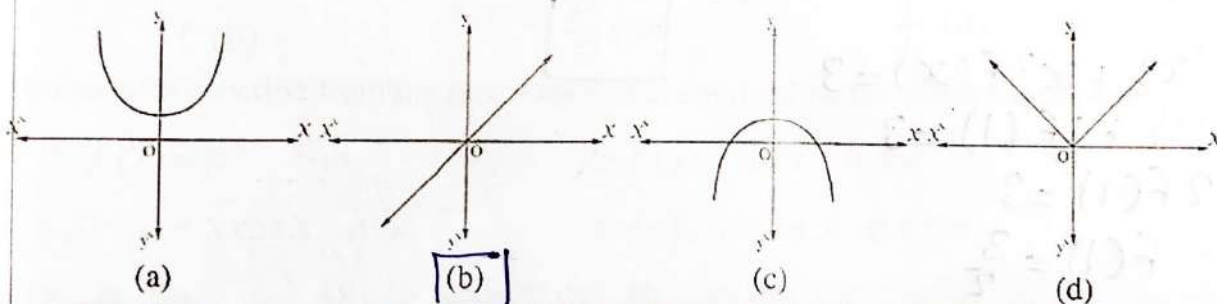
- (a) -3 (b) 3 (c) $\frac{5}{3}$ (d) $-\frac{5}{3}$

$$3m + 7 = -2$$

$$3m = -9$$

$$m = -3$$

29) Which of the following represents one - to - one function ?



30) The range of the function $f : f(x) = \frac{x^2 - 3x}{x}$ where $x \neq 0$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\{0\}$ (d) $\mathbb{R} - \{-3\}$

$$f(x) = \frac{x^2}{x} - \frac{3x}{x}$$

$$= x - 3$$

Domain = $\mathbb{R} - \{0\}$

Range = $\mathbb{R} - \{-3\}$

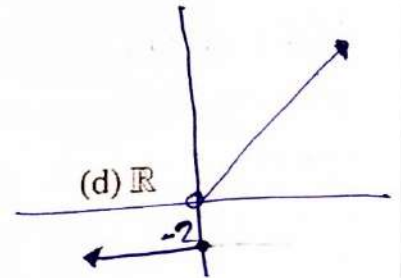
1) The range of the function $f : f(x) = \begin{cases} x & , x > 0 \\ -2 & , x \leq 0 \end{cases}$ is

(a) $\mathbb{R}^+$

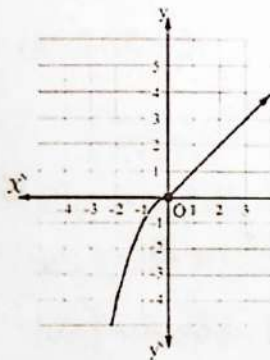
(b) $\mathbb{R}^+ - \{-2\}$

(c) $\mathbb{R}^+ \cup \{-2\}$

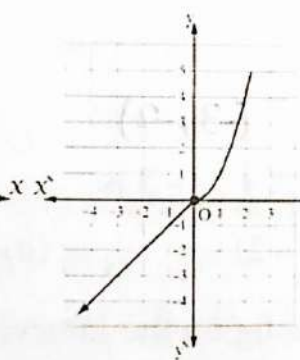
(d) $\mathbb{R}$



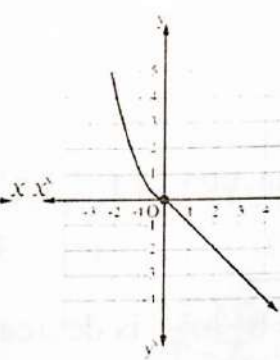
32) The curve of the function $f : f(x) = \begin{cases} x^2 & , x > 0 \\ x & , x \leq 0 \end{cases}$ is



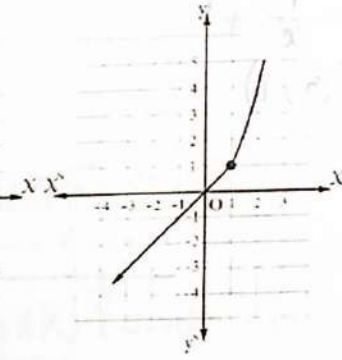
(a)



(b)



(c)

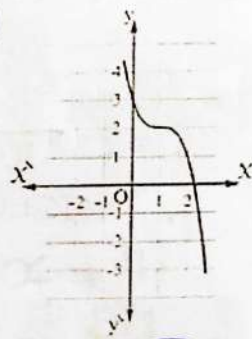


(d)

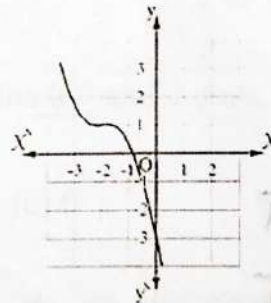
33) If $f(x) = 2 - (x-1)^3$, then the graph that represents the function f is



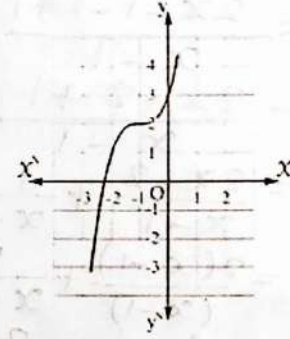
(a)



(b)



(c)



(d)

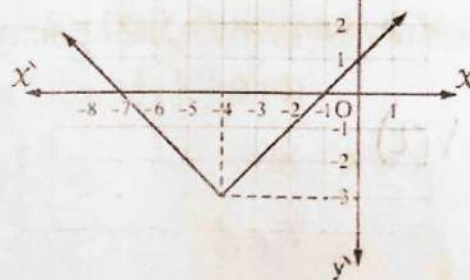
34) Which of the following function rules represents the curve in the given figure?

(a) $f(x) = |x-4| - 3$

(b) $f(x) = |x-4| + 3$

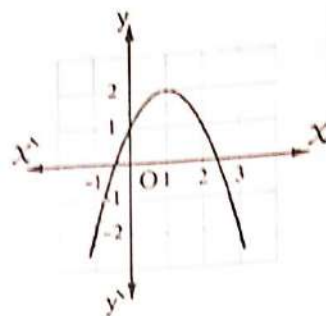
(c) $f(x) = |x+4| - 3$

(d) $f(x) = |x+4| + 3$



35) Which of the following function rules is represented in the given figure ?

(1, 2)



(a) $f(x) = (x-1)^2 + 2$ (b) $f(x) = 1 - (x-2)$

(c) $f(x) = 2 - (x-1)^2$ (d) $f(x) = (x+1)^2 -$

36) The symmetric point of the function $f : f(x) = \frac{x+1}{x}$ is

(a) (1, 0)

(b) (0, 1)

(c) (0, 0)

(d) (1, -1)

$$f(x) = \frac{x}{x} + \frac{1}{x}$$

$$= \frac{1}{x} + 1$$

(0, 1)

(-3, -2)

37) The vertex of the curve of the function $f : f(x) = |x+3| - 2$ is

(a) (3, 2)

(b) (-3, -2)

(c) (-3, 2)

(d) (3, -2)

38) The function f where $f(x) = \frac{2x-1}{x-1}$ is decreasing on the interval

(a) $]-\infty, 1]$

(b) $]-\infty, 1[,]1, \infty[$

(c) $[1, \infty[$

(d) $]-\infty, 2[,]2, \infty[$

$$f(x) = \frac{2x-1-1+1}{x-1}$$

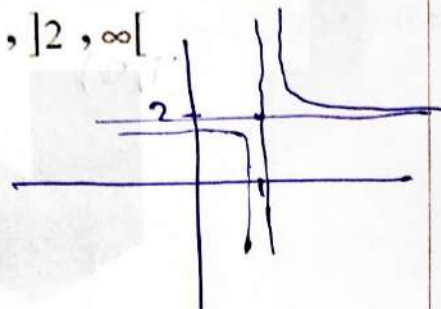
$$= \frac{2x-2+1}{x-1}$$

$$= \frac{2x-2}{x-1} + \frac{1}{x-1}$$

$$= \frac{2(x-1)}{(x-1)} + \frac{1}{x-1}$$

$$= \frac{1}{x-1} + 2$$

Point of symmetry = (1, 2)



39) The range of the function $f : f(x) = 2 - \frac{3}{x-1}$ is

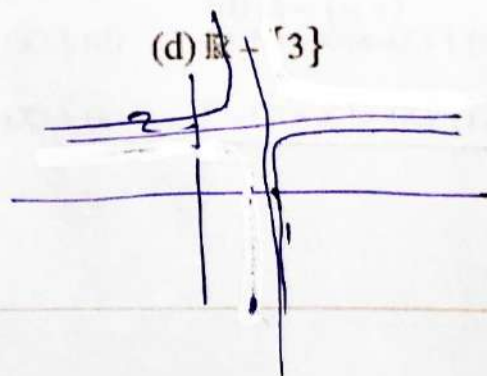
(a) $\mathbb{R}$

(b) $\mathbb{R} - \{1\}$

(c) $\mathbb{R} - \{2\}$

(d) $\mathbb{R} - \{3\}$

(1, 2)



$$4 - x = 0$$

$$x = 4$$

40) The range of the function $f : f(x) = |4 - x|$ is

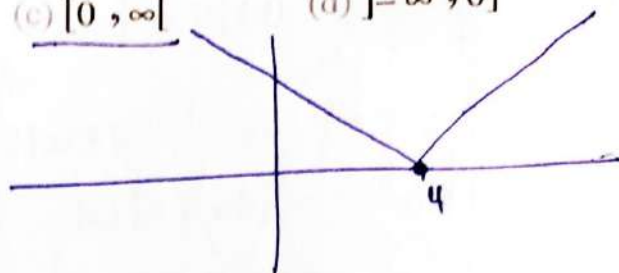
(a) $\mathbb{R}^+$

(b) $\mathbb{R}$

(c) $[0, \infty[$

(d) $]-\infty, 0]$

point = (4, 0)



41) If the curve $y = f(x)$ represents a real function then its image by translation 5 units vertically downward is the same as $g(x) = \dots$

(a) $f(x - 5)$

(b) $f(x + 5)$

(c) $f(x) + 5$

(d) $f(x) - 5$

42) If f is a real function whose domain is $[-2, 3]$, then the domain of $g : g(x) = f(x - 2)$ is

(a) $[-2, 3]$

(b) $[-4, 1]$

(c) $[0, 5]$

(d) $\mathbb{R}$

43) If the curve $f(x) = -x^3$ moves 4 units to the left and 2 units upwards to become the curve $g(x)$, then $g(-2) = \dots$

(a) -218

(b) 214

(c) 6

(d) -6

$$g(x) = 2 - (x + 4)^3$$

$$g(-2) = 2 - (-2 + 4)^3 = -6$$

44) The curve of the function $g : g(x) = x$ is the same as the curve of the function $f : f(x) = \dots$ by reflection in the x -axis.

(a) x

(b) $-x$

(c) $x + 1$

(d) $-x + 1$

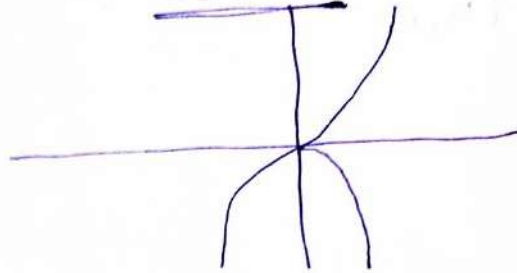
45) The range of the function f where $f(x) = -|x^3|$ is

(a) $\mathbb{R}$

(b) $[0, \infty[$

(c) $]-\infty, 0]$

(d) $\mathbb{R} - \{0\}$



46) The solution set of the equation $|x - 3| = 5$ in $\mathbb{R}$ is

(a) $\{3, 5\}$

(b) $\{-2, 8\}$

(c) $[-2, 8]$

(d) $\{-8, 8\}$

$$\begin{aligned} x - 3 &= \pm 5 \\ x - 3 &= 5 \quad \text{or} \quad x - 3 = -5 \\ x &= 8 \quad \quad \quad x = -5 + 3 \\ & \quad \quad \quad x &= -2 \end{aligned}$$

47) The solution set of the equation $|x - 3| = |3 - x|$ in $\mathbb{R}$ is

(a) $\{3\}$

(b) $\{3, -3\}$

(c) $\mathbb{R}$

(d) $\emptyset$

$$\begin{aligned} |x - 3| &= |-x + 3| \\ &= |-(x - 3)| \\ &= |x - 3| \\ \text{s.s} &= \mathbb{R} \end{aligned}$$

48) The solution set of the equation : $|x - 3| = 2x + 9$ in $\mathbb{R}$ is

(a) $\{-11\}$

(b) $\{-2\}$

(c) $\{-2, -11\}$

(d) $\emptyset$

$$\begin{aligned} x - 3 &= 2x + 9 \\ 2x - x &= -3 - 9 \\ x &= -12 \end{aligned}$$

check

$$|-12 - 3| = 15$$

$$2(-12) + 9 = -15$$

NOT SOLUTION

$$\begin{aligned} x - 3 &= -2x - 9 \\ x + 2x &= -9 + 3 \\ 3x &= -6 \\ x &= -2 \end{aligned}$$

$$|-2 - 3| = 5$$

$$2(-2) + 9 = 5$$

s.s = $\{-2\}$

4) The solution set of the inequality $|x - 2| \leq -4$ in $\mathbb{R}$ is

- (a) $] -2, 6[$ (b) $[-2, 6]$ (c) $\mathbb{R}$ (d) $\emptyset$

50) The solution set of the inequality : $|x - 2| > 3$ is

- (a) $\mathbb{R} - [-1, 5]$ (b) $\mathbb{R} -] -1, 5[$ (c) $[-1, 5]$ (d) $] -1, 5[$

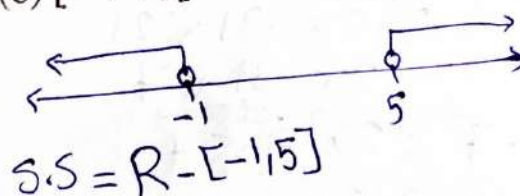
$$x - 2 > 3$$

$$x > 5$$

$$x - 2 < -3$$

$$x < -3 + 2$$

$$x < -1$$



$$S.S = \mathbb{R} - [-1, 5]$$

51) The solution set of the inequality : $|2 - x| \leq 4$ is

- (a) $\mathbb{R} - [-2, 6]$ (b) $\mathbb{R} -] -2, 6[$ (c) $] -2, 6[$ (d) $[-2, 6]$

$$-4 \leq 2 - x \leq 4$$

$$-4 - 2 \leq -x \leq 4 - 2$$

$$-6 \leq -x \leq 2$$

$$\frac{-6}{-1} \geq x \geq \frac{2}{-1}$$

$$6 \geq x \geq -2$$

$$6 \geq x \geq -2$$

$$-2 \leq x \leq 6$$

52) The solution set of the inequality : $\frac{1}{|x - 2|} \geq \frac{1}{2}$ in $\mathbb{R}$ is

- (a) $]0, 4[$ (b) $[0, 4] - \{2\}$ (c) $[0, 4]$ (d) $]0, 4]$

$$2 \geq |x - 2|$$

$$|x - 2| \leq 2$$

$$-2 \leq x - 2 \leq 2$$

$$-2 + 2 \leq x \leq 2 + 2$$

$$0 \leq x \leq 4$$

$$S.S = [0, 4] - \{2\}$$

53) The solution set of the inequality : $|2x - 3| + |6 - 4x| \leq 21$ is

- (a) $[-2, 5]$ (b) $\mathbb{R} -]-2, 5[$ (c) $]-2, 5[$ (d) $\{-2, 5\}$

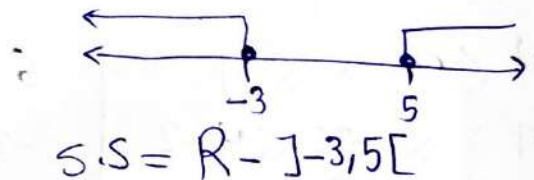
$$\begin{aligned} |2x - 3| + |-4x + 6| &\leq 21 \\ |2x - 3| + |-2(2x - 3)| &\leq 21 \\ |2x - 3| + 2|2x - 3| &\leq 21 \\ 3|2x - 3| &\leq 21 \\ |2x - 3| &\leq 7 \\ -7 &\leq 2x - 3 \leq 7 \\ -7 + 3 &\leq 2x \leq 7 + 3 \end{aligned}$$

$$\begin{aligned} -4 &\leq 2x \leq 10 \\ \frac{-4}{2} &\leq x \leq \frac{10}{2} \\ -2 &\leq x \leq 5 \\ \text{S.S} &= [-2, 5] \end{aligned}$$

54) The solution set of the inequality : $\sqrt{x^2 - 2x + 1} \geq 4$ in $\mathbb{R}$ is

- (a) $[-3, 5]$ (b) $\mathbb{R} -]-3, 5[$ (c) $]-3, 5[$ (d) $\mathbb{R} - [-3, 5]$

$$\begin{aligned} (x - 1)^2 &\geq 4 \\ |x - 1| &\geq 2 \\ x - 1 &\geq 2 \quad \text{or} \quad x - 1 \leq -2 \\ x &\geq 3 \quad \text{or} \quad x \leq -1 \end{aligned}$$



55) The solution set of the equation : $|x| = -x$ in $\mathbb{R}$ is

- (a) $\emptyset$ (b) $\mathbb{R}$ (c) $\mathbb{R}^-$ (d) $]-\infty, 0]$

56) If $f(x) = x|x + 2| + 3$, $f(m - 1) = 6$, then $m =$

- (a) -2 (b) 2 (c) $\sqrt{2}$ (d) $-\sqrt{2}$

$$\begin{aligned} (m - 1)|m - 1 + 2| + 3 &= 6 \\ (m - 1)|m + 1| &= 3 \\ (m - 1)(m + 1) &= 3 \quad | \quad (m - 1)(1 - m) = 3 \\ m^2 - 1 &= 3 \\ m^2 &= 4 \\ m &= \pm\sqrt{4} = \pm 2 \\ m &= 2 \checkmark \\ m &= -2 \times \end{aligned}$$

4) The domain of the function $f(x) = \frac{2}{|x|-2}$ is

(a) $\mathbb{R} - \{2\}$

(b) $\mathbb{R} - \{-2\}$

(c) $\mathbb{R}$

(d) $\mathbb{R} - \{2, -2\}$

$$|x| - 2 = 0$$

$$|x| = 2$$

$$x = 2 \text{ or } x = -2$$

$$\text{Domain} = \mathbb{R} - \{\pm 2\}$$

58) The absolute value inequality that represents that the score of a student in one test (x) is including between 70 to 90 is

(a) $|x| \leq 90$

(b) $|x| \geq 70$

(c) $|x - 80| \leq 10$

(d) $|x - 70| \leq 90$

$$70 \leq x \leq 90 \quad (-80)$$

$$|x - 80| \leq 10$$

$$70 - 80 \leq x - 80 \leq 90 - 80$$

$$-10 \leq x - 80 \leq 10$$

Essay questions

59) Determine the type of the function defined by the following rule, whether it is even, odd or otherwise $f(x) = 3x - 4x^3$

$$f(x) = 3x - 4x^3$$

$$f(-x) = 3(-x) - 4(-x)^3$$

$$= -3x + 4x^3$$

$$= -f(x)$$

$f(x)$ is odd function

60) Graph the function $f(x) = (x-1)^2$, from the graph find the range of the function, then determine its monotony and its type whether it is even, odd or otherwise.

Vertex = (1, 0)

x	-1	0	1	2	3
$f(x)$	4	1	0	1	4

Range $[0, \infty[$
 decrease $]-\infty, 1[$
 increase $]1, \infty[$
 otherwise



61) Represent the function $f(x) = (x-2)^3 + 1$ graphically, then from the graph find the domain, its type if it is even, odd or otherwise

Vertex = (2, 1)

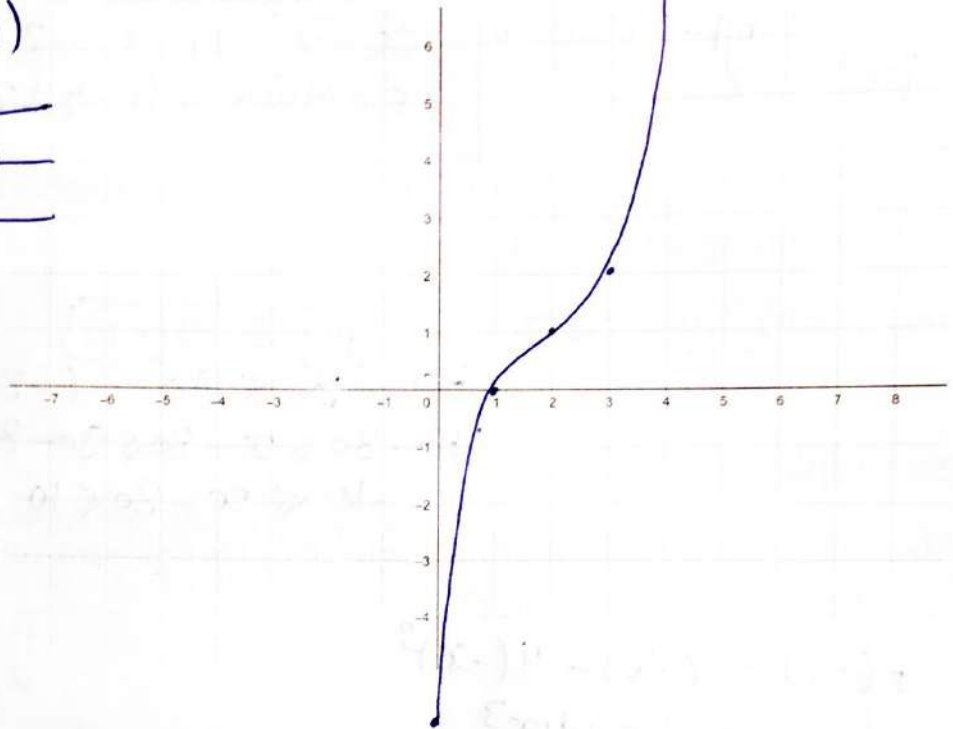
x	0	1	2	3	4
y	-7	0	1	2	9

$$f(3) = (3-2)^3 + 1 = 2$$

$$f(4) = (4-2)^3 + 1 = 9$$

$$f(1) = (1-2)^3 + 1 = 0$$

$$f(0) = (-2)^3 + 1 = -7$$



61) Draw the curve of the function $f(x) = |x - 2|$ and determine its range and type whether it is even, odd or otherwise.

Vertex = (2, 0)

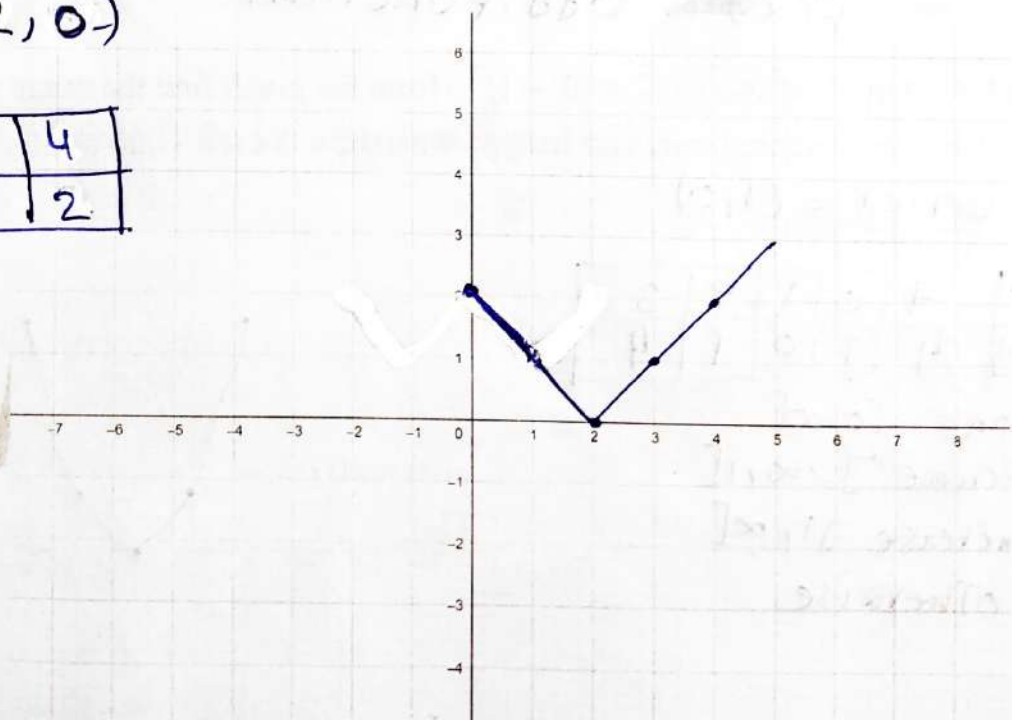
x	0	1	2	3	4
y	2	1	0	1	2

$$f(0) = 2$$

$$f(1) = 1$$

$$f(3) = 1$$

$$f(4) = 2$$



حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

الترم الاول



Algebra Revision 2nd Sec

1) The function $f(x) = 4x^2 - 8x + 15$ is symmetric around the straight line whose equation is

- a) $x = 2$ b) $x = 4$ c) $x = 1$ d) $x = y$

2) The function $f(x) = 9x^2 - 12x + 9$ its vertex is

- a) $(2, 5)$ b) $(3, 2)$ c) $\left(\frac{2}{3}, 5\right)$ d) $(3, 5)$

3) If f, g are two real functions, $f(x) = x^2 - 4$, $g(x) = \sqrt{x - 1}$, find the domain for each

1- $(f + g)$ is

- a) $\mathbb{R}$ b) $[1, \infty[$ c) $\mathbb{R} - \{1\}$ d) $] - \infty, \infty[$

2- $\left(\frac{f}{g}\right)$ is

- a) $\mathbb{R}$ b) $]1, \infty[$ c) $[1, \infty[$ d) $\mathbb{R} - \{1\}$

3- $(f \circ g)$ is

- a) $\mathbb{R}$ b) $]1, \infty[$ c) $[1, \infty[$ d) $\mathbb{R} - \{1\}$

4) The function $f(x) = \begin{cases} 2x + x^2, & x \leq 0 \\ 2x - x^2, & x > 0 \end{cases}$ is

- a) even b) odd c) neither even nor odd d) both a and b

5) Which of the following is one to one function

- a) $f(x) = (x + 3)^2$ b) $f(x) = \frac{1}{x^2 - 4}$ c) $f(x) = 4 - 5x$ d) $f(x) = 5$

6) The function $f(x) = (x - 3)^2 + 5$ is increasing on

- a) $] - \infty, 3]$ b) $[3, \infty[$ c) $[5, \infty[$ d) none of the previous

7) The function $f(x) = x^2 - 5, x \geq 0$ is decreasing when $x \in$

- a) $] - \infty, 0]$ b) $[0, \infty[$ c) $[-5, \infty[$ d) there is no answer

8) The s. s of the inequality $\sqrt{(x + 2)^2} + |2x + 4| \geq 6$ is

- a) $[-4, 0]$ b) $\mathbb{R} - [-4, 0]$ c) $\mathbb{R} -] - 4, 0[$ d) $] - 4, 0[$

9) If $f(x)$ is even function and $f(3) = 2f(-1)$, so $f(-3) = \dots\dots\dots$

- a) $f(1)$ b) $f(-1)$ c) $2f(3)$ d) $2f(1)$

10) If $f(x)$ is one to one and odd function $f(3) = f(a)$, so $f(-a) = \dots\dots\dots$

- a) $f(3)$ b) $f(a)$ c) $-f(3)$ d) no answer

11) $5|3 - x| - 2\sqrt{x^2 - 6x + 9} = 12$ it's S.S is $\dots\dots\dots$

- a) $\{3, 2\}$ b) $\{7, -1\}$ c) $\mathbb{R}$ d) $\{-2, 7\}$

12) The S.S of $\log_2(3^x - 3^{x-2}) = 3$ is $\dots\dots\dots$

- a) $\{2\}$ b) $\{-2\}$ c) both a and b d) none of the previous

13) The S.S $\log_9 \log_3 \log_x 27 = 0$ is $\dots\dots\dots$

- a) $\{4\}$ b) $\{3\}$ c) $\{2\}$ d) none of the previous

14) S.S of $x^{\log x} = 10000$ is $\dots\dots\dots$

- a) 100 b) 0.01 c) both a and b d) none of the previous

15) The S.S of $\log \sqrt[3]{3x-1} + \log \sqrt[3]{x-2} = \log 20 - 1$ is $\dots\dots\dots$

- a) $\{3\}$ b) $\{-3\}$ c) $\{43\}$ d) none of the previous

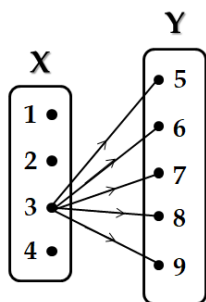
16) $\log \tan 1^\circ \times \log \tan 2^\circ \times \log \tan 3^\circ \times \dots \times \log \tan 73^\circ = \dots\dots\dots$

- a) 1 b) 3 c) zero d) none of the previous

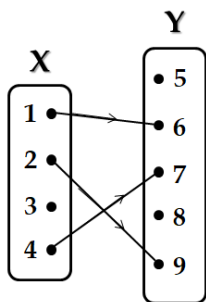
17) $\log \tan 1^\circ + \log \tan 2^\circ + \log \tan 3^\circ + \dots + \log \tan 89^\circ = \dots\dots\dots$

- a) 1 b) 3 c) zero d) none of the previous

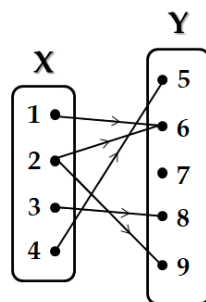
18) Which of the following arrows represent a function from x to?



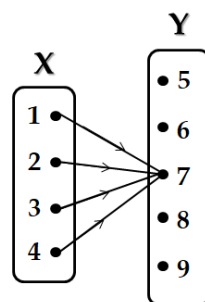
(a)



(b)



(c)



(d)

19) If the function f is even over $[a, b]$, then $b = \dots\dots\dots$

- a) a b) $-a$ c) $2a$ d) a^3

20) If f is an odd function, $f(1) = 2$, then which of the following points lies on the curve?

- a) $(-1, 2)$ b) $(-1, -2)$ c) $(1, -2)$ d) $(-1, 0)$

21) If f, g are two function $f(x) = x^3, g(x) = x + 2$, then $(g \circ f)(x)$ is $\dots\dots\dots$ function.

- a) one to one b) odd c) even d) linear

22) If $f(x) = 7$, then the range of the function is $\dots\dots\dots$

- a) $\mathbb{R}$ b) $\mathbb{R}^+$ c) $\{7\}$ d) $\mathbb{R} - \{7\}$

23) The range of the function $f: f(x) = \begin{cases} 0, & \text{when } x \leq 0 \\ 1, & \text{when } x > 0 \end{cases}$ is $\dots\dots\dots$

- a) $\{1\}$ b) $\{0\}$ c) $\mathbb{R}$ d) $\{0, 1\}$

24) If $\log_3 5 = a$, then $\log_{15} 5 = \dots\dots\dots$

- a) a^2 b) $3a$ c) $\frac{1}{a+3}$ d) $\frac{a}{a+1}$

25) If $\log_{\frac{1}{2}} f(x) = x$, then $8f(2) + f(-3) + f(0) = \dots\dots\dots$

- a) $\frac{1}{16}$ b) $\frac{1}{8}$ c) 11 d) 22

26) If $5^{x-1} = 4^{x-1}$, then $x = \dots\dots\dots$

- a) 5 b) 1 c) -1 d) 0

27) Which of the functions that are defined by the following rules represents an exponential decay function?

- a) $f(x) = 2^x$ b) $f(x) = \left(\frac{1}{3}\right)^{-x}$ c) $f(x) = 3^x$ d) $f(x) = \left(\frac{2}{3}\right)^x$

28) If the function $f: f(x) = \left(\frac{a}{3}\right)^x$ is an increasing exponential function, then $\dots\dots\dots$

- a) $a > 0$ b) $a > 1$ c) $a > 3$ d) $a < 3$

29) The curve of the function $f: f(x) = 3^{x+1}$ intersects the y -axis at the point $\dots\dots\dots$

- a) $(0, 1)$ b) $(1, 0)$ c) $(5, 1)$ d) $(1, 5)$

30) The area between the curves of the functions $f: f(x) = |x + 2| - 2 = 0$ and $g: g(x) = 0$ equals Square units.

- a) 2 b) 3 c) 4 d) 5

31) If the straight line $y = 8$ cuts the two curves $y = 2^x$, $y = \left(\frac{1}{2}\right)^x$ at the two points A, B respectively, then the length of $AB = \dots\dots\dots$ Length unit.

- a) 2 b) 3 c) 4 d) 6

32) If $f(x) = \frac{9^x}{9^x + 3}$, then $f(x) + f(1 - x) = \dots\dots\dots$

- a) $\frac{2}{9^x + 3}$ b) $\frac{9^x + 3}{2}$ c) $\frac{1}{3}$ d) 1

33) If $\log x = z + \log y$, then $x = \dots\dots\dots$

- a) $y \times 10^z$ b) $\frac{z}{y}$ c) $z - (10)^y$ d) $\frac{1}{y} \times (10)^z$

34) $\frac{1}{1 + \log_b a + \log_b c} + \frac{1}{1 + \log_c a + \log_c b} + \frac{1}{1 + \log_a b + \log_a c} = \dots\dots\dots$

- a) $\log_a bc$ b) $\log_b ac$ c) $\log_c ab$ d) 1

35) The sum of the roots of the equation: $(25)^x - 12 \times (5)^x + 27 = 0$

- a) $\log_5 12$ b) 12 c) $\log_5 27$ d) 27

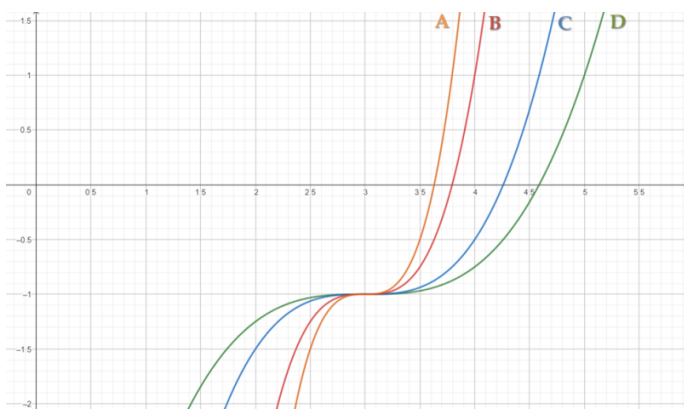
36) If $a > b > c > 1$, then $\log_c \log_b \log_a a^{b^c}$

- a) zero b) 1 c) 2 d) abc

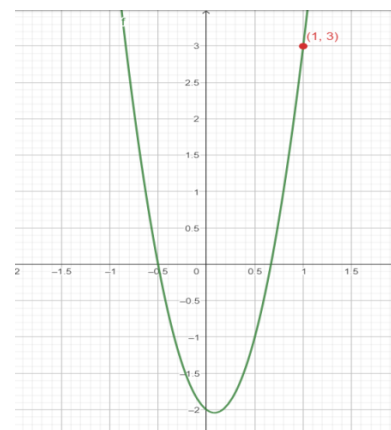
37) In the opposite figure:
Which of the following is the graph of the equation

$$y = \frac{1}{4}(x - 3)^3 - 1$$

- a) A b) D
c) B d) C



38) Write the quadratic equation represented by the graph shown.
Give your answer in factored form.



a) $y = (x + 2)(2x - 3)$ b) $y = (2x - 1)(3x + 2)$

a) $y = (x - 2)(2x + 3)$ b) $y = (2x + 1)(3x - 2)$

39) Consider the function $f(x) = -3\sqrt{x+2} - 1$. The function $g(x)$ is obtained by reflecting the graph of $f(x)$ in the y -axis. What is the equation of $g(x)$?

a) $g(x) = -3\sqrt{2-x} - 1$

b) $g(x) = 3\sqrt{x+2} + 1$

c) $g(x) = 3\sqrt{x+2} - 1$

d) $g(x) = -3\sqrt{x+2} + 1$

40) The curve of the function $f: f(x) = |x - 2|$ is symmetric about the straight line

a) $x = 2$

b) $x = -2$

c) $y = 2$

d) $y = -2$

41) If $g(x)$ is decreasing on $] -\infty, 0[$ and is increasing on $]0, \infty[$, then $f(x) = g(x + 1)$ is increasing on

a) $] -1, \infty[$

b) $] -\infty, -1[$

c) $]0, \infty[$

d) $] -\infty, 0[$

42) Find in $\mathbb{R}$ the solution set of $(x - 3)^{x-6} = 1$

a) $x = 6$

b) $x = 4$

c) $x = 2$

d) all the previous

43) Find the solution set of $\frac{1024^{7x+6} \times 8^{7x-2}}{64^{9x} \times 512^{4x+6}} = 32$ in $\mathbb{R}$

a) $\{7\}$

b) $\{5\}$

c) $\{6\}$

d) $\{4\}$

44) Given that $f(x + 10) = 8^x$, determine the value of x that satisfies the equation $f(4x + 1) - f(4x - 1) = 504$.

a) 1

b) 1.5

c) 4

d) 3

45) What is the value of a that would make $f(x) = -ax - 2$ an inverse of itself?

a) 1

b) -1

c) 2

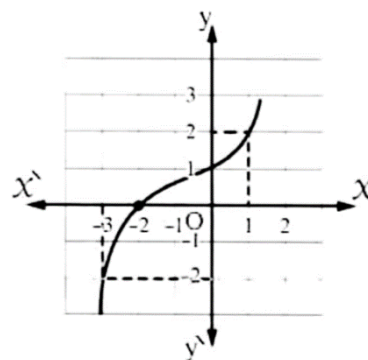
d) $\frac{1}{2}$

46) If $f: \mathbb{R} \rightarrow \mathbb{R}$ where $f(x) = \sqrt[3]{x-5}$, $g: \mathbb{R} \rightarrow \mathbb{R}$ where $g(x) = 2x - 7$, then $(g \circ f^{-1})(x) = \dots\dots\dots$

- a) $2x^3 - 3$ b) $2x^3 - 5$ c) $2x^3 + 3$ d) $2x^3 + 5$

47) The opposite figure represents the curve of the function $f^{-1}(x)$, then $(f \circ f)(0) = \dots\dots\dots$

- a) -3 b) -2
c) zero d) 1



48) Find the solution set of $(\log_2 x)^2 - \log_2 x^{-7} = 8$ in $\mathbb{R}$

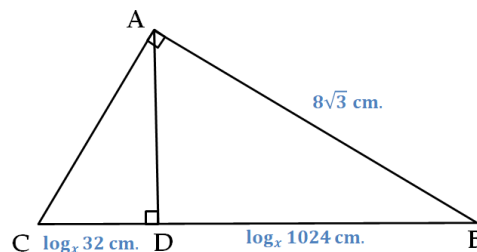
- a) $\{2\}$ b) $\{256, \frac{1}{2}\}$ c) $\{2, \frac{1}{256}\}$ d) $\{128, \frac{1}{256}\}$

49) Given that the graph of the function $f(x) = \log_a x$ passes through the point $(1024, 5)$, find the value of a .

- a) 20 b) 1 c) $\sqrt[4]{5}$ d) 4

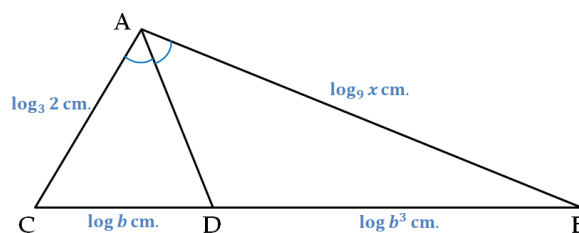
50) Given that $\overline{AB} \perp \overline{AC}$ and $\overline{AD} \perp \overline{BC}$, determine the value of x , give your answer to the nearest tenth.

- a) 1.8 b) 2.7
c) 4.1 d) 1.3



51) Given that $\overline{AD}$ bisects $\angle A$, find the value of x .

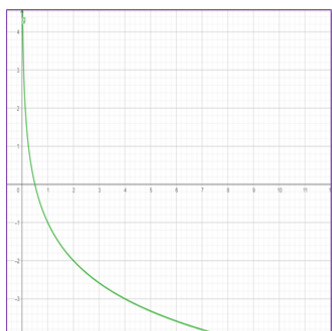
- a) 64 b) 87
c) 100 d) 55



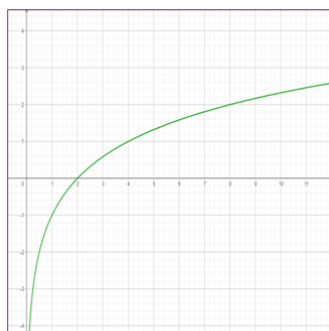
52) Determine the solution set of the equation $\log_3 x + \log_{243} x^5 + 3 = 0$ in $\mathbb{R}$.

- a) $\{27\}$ b) $\left\{\frac{1}{27}\right\}$ c) $\{3\sqrt{3}\}$ d) $\left\{\frac{1}{3\sqrt{3}}\right\}$

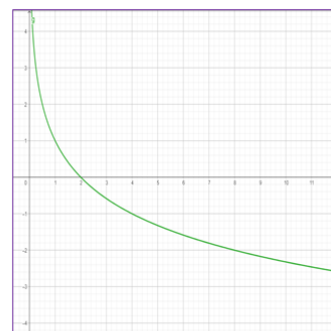
53) Which graph represents the function $f(x) = 1 - \log_2 x$?



(a)



(b)



(c)

54) If $x^{\frac{3}{2}} = 3y^{\frac{2}{3}} = 27$ then find the value of $x + y$

- a) 36 b) -18 c) 18 d) a & b are correct

55) The number of spectators of a football team decreases at the rate 4% each match as a result of recurrent loss in a championship. If the number of spectators in the first match was 36400, write the exponential function which represents the number of spectators (y) in the match (t), then estimate the number of fans in the tens match.

56) The number of cows in a cattle farm is 80 cows and reproduction rate of these cows is 18% annually. Find the number of cows after four years.

57) The number of populations in a city of A.R.E reached 4.6 million people with an average increase 4% annually.

1- Write the exponential growth function after (t) year.

2- Estimate of population after 5 years.

58) If the amount of the bacterium at an instant 2000 bacterium and it is increasing with the rate 7% per hour. Find the amount of the bacterium after 11 hour.

59) Draw the curve of the function f in each of the following and determine its domain, range and discuss its monotonicity and its type whether it is even, odd or otherwise and write the equation axis of symmetry or point of symmetry if exist:

1- $g(x) = -\frac{1}{2}x^2$

2- $g(x) = \left(x + \frac{3}{2}\right)^2 - \frac{1}{2}$

3- $g(x) = 2x^3 - 1$

4- $g(x) = 2|x|$

5- $g(x) = 2|x - 7| + 2$

6- $g(x) = \frac{x-3}{x-2}$

7- $g(x) = \frac{x-1}{x^2-1}$

8- $f(x) = (x - 2)|x|$

9- $f(x) = \begin{cases} x^2 + 1, & -4 \leq x < 0 \\ -x^2 - 1, & 0 \leq x \leq 4 \end{cases}$

10- $f(x) = \frac{x+1}{x}$

Answers:

1) c	2) c	3) b, b, c	4) b	5) c	6) b
7) d	8) b	9) d	10) c	11) b	12) a
13) b	14) c	15) a	16) c	17) c	18) d
19) b	20) b	21) a	22) c	23) d	24) d
25) c	26) b	27) d	28) c	29) a	30) c
31) d	32) d	33) a	34) d	35) c	36) b
37) b	38) d	39) a	40) a	41) a	42) d
43) b	44) d	45) a	46) c	47) a	48) c
49) d	50) a	51) a	52) d	53) c	54) d

55) $f(t) \approx 24200$

56) $f(t) = 155$

57) 1- $f(t) = 4.6 \times (1.04)^t$

2- at $t = 5 \rightarrow \therefore f(5) = 4.6 \times (1.04)^5 = 5.6$

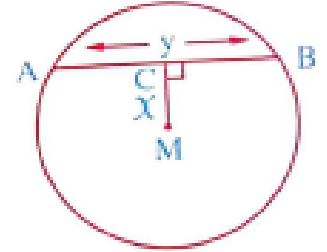
58) $f(t) = 4210$

Mathematics Teacher

**Differentiation
Revision Sheet 1**

Answer the following:

- (1) The opposite figure represents a circle M, its radius length is 5 cm, MC is perpendicular to AB, the length of MC = x and the length of AB = y ,



when $x \rightarrow 0$, then: $y \rightarrow \dots \dots \text{ cm.}$

- a) 2.5 b) 5 c) 10 d) 20
- (2) If $\lim_{x \rightarrow 2} \frac{x^2 - 4a}{x - 2}$ exists, then $a = \dots \dots \dots$ a) -1 b) 1 c) 2 d) 4
- (3) If $\lim_{x \rightarrow 2} \frac{f(x) - 5}{x - 2} = 1$, where f is a polynomial function, then find: $\lim_{x \rightarrow 2} f(x)$
a) 2 b) 5 c) 0 d) -5
- (4) If: $n(x)$ is a function and $\lim_{x \rightarrow 2} \frac{n(x) - 8}{x - 2} = 7$, then $\lim_{x \rightarrow 2} \frac{2x^2 - n(x)}{x - 2} = \dots \dots \dots$
a) 1 b) 7 c) 8 d) 15
- (5) If $\lim_{x \rightarrow \infty} \frac{ax + 6}{2x - 7} = 4$, then $a = \dots \dots \dots$ a) 2 b) 4 c) 6 d) 8
- (6) If $\lim_{x \rightarrow \infty} f(x) = 5$ and $\lim_{x \rightarrow -2} f(x) = 2$, where $f(x) = \frac{2 - ax^2}{3 - bx + x^2}$, then $a + b = \dots$
a) 3 b) -3 c) 0 d) does not exist
- (7) If $\lim_{x \rightarrow \infty} \frac{x^3 + 2x + 1}{(a + 1)x^4 + (7 - b)x^3 + x^2} = \infty$, then $a + b = \dots \dots \dots$
a) 6 b) 4 c) 0 d) does not exist

(8) $\lim_{n \rightarrow \infty} n \left[\left(a + \frac{1}{n} \right)^4 - a^4 \right] = \dots\dots\dots$
 a) $4a^3$ b) 4 c) ∞ d) 0

(9) If $\lim_{x \rightarrow 6} \frac{x^2 + kx + 6m}{x - 6} = 15 \rightarrow$ then determine the values of m & k respectively
 a) 6,15 b) 6,-12 c) -15,15 d) -9,3

(10) $\lim_{x \rightarrow \frac{1}{2}} 10 = \dots\dots\dots$ a) 5 b) 20 c) 10 d) $10\frac{1}{2}$

(11) $\lim_{x \rightarrow 0} \frac{\sqrt{x+1}-1}{x} = \dots\dots\dots$ a) zero b) $\sqrt{2}$ c) $\frac{1}{2}$ d) has no existence

(12) $\lim_{x \rightarrow 2} \frac{x^4 - 2x^3 - 6x + 12}{x^2 + x - 6} = \dots\dots\dots$ a) $\frac{2}{5}$ b) 2 c) $\frac{5}{2}$ d) 0

(13) $\lim_{x \rightarrow 0} \frac{\cos^2 x - 5 \cos x + 4}{3x^{-2} + x^{-3} - 4} = \dots\dots\dots$ a) $\frac{1}{2}$ b) 1 c) $\frac{3}{2}$ d) 0

(14) $\lim_{x \rightarrow 1} \frac{1 - \sqrt[n]{x}}{1 - \sqrt[m]{x}} = \dots\dots\dots$ a) 1 b) n/m c) -1 d) m/n

(15) $\lim_{x \rightarrow 1} \frac{x^{12} - a^{12}}{x^{10} - a^{10}} = 30, a = \dots\dots\dots$ a) ± 5 b) 5 c) ± 6 d) 6

(16) $\lim_{x \rightarrow \infty} (2x^{-1} - x^{-2})\sqrt{4x^2 + 1} = \dots\dots\dots$
 a) 4 b) 0 c) ∞ d) not exist

(17) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{\tan 5x} = \dots\dots\dots$ a) 5 b) $\frac{6}{5}$ c) 1 d) zero

(18) $\lim_{x \rightarrow 3} \frac{\tan(x-3)}{x^3 - 27} = \dots\dots\dots$ a) $\frac{1}{9}$ b) $\frac{1}{27}$ c) $\frac{1}{3}$ d) 0

(19) $\lim_{x \rightarrow 0} \frac{\sin x (1 - \cos x)}{x^2} = \dots\dots\dots$ a) 1 b) 0 c) 2 d) ∞

(20) if $\lim_{x \rightarrow 0} \frac{(a+3)x}{\sin ax} = \frac{2}{5}$, then: a =
 a) -5 b) -3 c) -1 d) 3

(21) $\lim_{x \rightarrow 0} \frac{\sin ax}{bx} = \frac{1}{3}$, $\lim_{x \rightarrow 0} \frac{\tan bx}{cx} = \frac{4}{3}$, then $\frac{a}{c} = \dots \dots \dots$

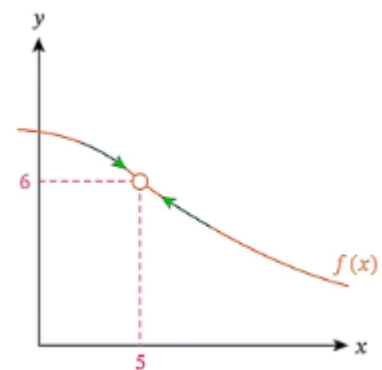
- a) -4 b) 1/4 c) 4/9 d) 1/12

(22) $\lim_{x \rightarrow 1} \frac{\tan(x-1)}{\sqrt{x}-1} = \dots \dots \dots$ a) 2 b) zero c) -2 d) $\frac{1}{2}$

(23) if $f(x) = x^2$, then $\lim_{x \rightarrow 2} f(f(x)) = \dots \dots \dots$ a) 2 b) 4 c) 16 d) 32

(24) Find $f(5)$

- a) 5
b) Undefined
c) zero
d) 6



(25) Find: $\lim_{x \rightarrow -6} \frac{x^2 - 2x - 48}{x^3 + x^2 - 54x - 144}$

- a) Doesn't exist b) -1/5 c) 3/7 d) -1/3

(26) If $\lim_{x \rightarrow 6} \frac{x^2 + kx + 6m}{x - 6} = 15 \rightarrow$ then determine the values of m & k respectively

- a) 6,15 b) 6,-12 c) -15,15 d) -9,3

(27) Given that $\lim_{x \rightarrow a} f(x) = -\infty$, if possible, evaluate $\lim_{x \rightarrow a} 16 f(x)$

- a) Not possible b) ∞ c) $-\infty$ d) 16

(28) Given that $\lim_{x \rightarrow \infty} \frac{-4ax^n - 2x^5 - 1}{2x^6 + 4x^5 - 1} = -4$, then determine the values of n and a

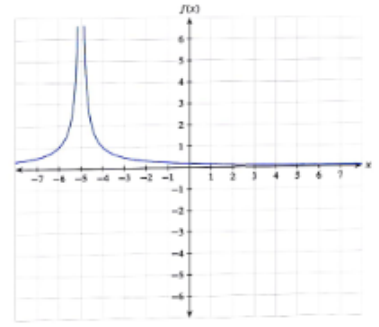
- a) 7,-4 b) 6,2 c) 7,8 d) 6,-8

(29) By rationalizing and using limit laws, determine $\lim_{n \rightarrow \infty} \sqrt{n^2 + 3n} - n$

- a) 3 b) 2 c) 6 d) 3/2

(30) Determine $\lim_{x \rightarrow 5^+} f(x)$

- a) -1 b) ∞
c) -5 d) $-\infty$

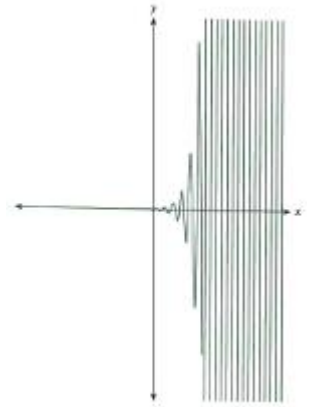


(31) Consider the graph of $f(x) = x^x \sin(4x)$

(i) Estimate $\lim_{x \rightarrow -\infty} f(x)$

(ii) Estimate $\lim_{x \rightarrow \infty} f(x)$

- a) $-\infty$ b) Doesn't exist c) ∞ d) 0



(32) Find $\lim_{x \rightarrow 1} \frac{x^{12} + x^{10} + x^9 - 3}{x - 1}$

- a) 31 b) 13 c) zero d) 1/31

(33) Find $\lim_{x \rightarrow 5} \frac{7}{(x-5)^5}$

- a) 0 b) -5 c) 7 d) doesn't exist

(34) Given that $\lim_{x \rightarrow 7} 2f(x) = -6$, then find $\lim_{x \rightarrow 7} f(x)^2$

- a) -12 b) -3 c) 9 d) 144

(35) Given that $\lim_{x \rightarrow 0} \frac{2a-x}{\cos 2x} = 4$, find the value of a

- a) 2 b) 3 c) 1/2 d) 1/3

#	Answer	#	Answer
1	C	21	C
2	B	22	C
3	B	23	C
4	C	24	B
5	D	25	D
6	B	26	D
7	A	27	C
8	A	28	b
9	D	29	D
10	C	30	B
11	C	31	B
12	A	32	A
13	D	33	D
14	D	34	C
15	A	35	A
16	A		
17	C		
18	B		
19	B		
20	A		

Omar  herbeni
Mathematics Teacher

Trigonometry & Differentiation Revision Sheet 2

Answer the following:

1) If the curve of the polynomial function f intersects the x-axis at $x=3$, then

- a) $\lim_{x \rightarrow 3} f(x) = 0$ b) $\lim_{x \rightarrow 0} f(x) = 3$ c) $\lim_{x \rightarrow 0} f(x) = 0$ d) $\lim_{x \rightarrow 3} f(x) = 3$

2) $\lim_{x \rightarrow -1} \frac{x^2+x}{x^3+1} = \dots\dots\dots$ a) zero b) $-1/3$ c) -1 d) has no existence

3) $\lim_{x \rightarrow 2} \frac{x^3-8}{3x^2-12} = \dots\dots\dots$ a) 0 b) 1 c) -1 d) 2

4) $\lim_{x \rightarrow 1} \frac{1-x^9}{x^7-1} = \dots\dots\dots$ a) $-9/7$ b) 1 c) $-7/9$ d) 0

5) $\lim_{x \rightarrow 5} \frac{\sqrt[3]{x+3}-2}{x-5} = \dots\dots\dots$ a) $1/12$ b) 0 c) 0 d) $5/12$

6) $\lim_{x \rightarrow 1} \left(\frac{x^6-x^7+x^8-x^9}{x-1} \right) = \dots\dots\dots$ a) 30 b) -2 c) 3 d) 9

7) $\lim_{x \rightarrow \infty} \frac{6x^2-5x}{(3-x)(2+x)} = \dots\dots\dots$ a) 6 b) -6 c) 0 d) undefined

8) $\lim_{x \rightarrow \infty} \frac{1}{x} \sqrt{3+4x^2} = \dots\dots\dots$ a) 0 b) 1 c) 2 d) undefined

9) $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{8x^2+1}}{\sqrt{x^4-3}} = \dots\dots\dots$ a) 0 b) 1 c) 2 d) undefined

10) $\lim_{x \rightarrow \infty} \frac{(12)^{\frac{1}{x}}}{x+7} = \dots\dots\dots$ a) 1 b) 0 c) $12/7$ d) ∞

11) $\lim_{x \rightarrow \infty} \frac{1}{x} (\sqrt{4x^2+1} - \sqrt{x^2+1}) = \dots\dots\dots$ a) 1 b) 0 c) 2 d) ∞

12) $\lim_{x \rightarrow 0} \frac{\sin \frac{1}{2}x}{\tan \frac{3}{4}x} = \dots\dots\dots$

- a) 1/6 b) 3/8 c) 1/2 d) 2/3

13) $\lim_{x \rightarrow 0} 3x \csc 2x = \dots\dots\dots$

- a) 6 b) 3/2 c) 2/3 d) has no existence

14) $\lim_{x \rightarrow 0} \frac{\tan 3x - \sin 4x}{x^2 + 2x} = \dots\dots\dots$

- a) 1/2 b) -1/2 c) 0 d) 1

15) $\lim_{x \rightarrow 0} \frac{x - x \cos x}{\sin^2 3x} = \dots\dots\dots$

- a) 0 b) 1 c) 2 d) 3

16) $\lim_{x \rightarrow 0} \frac{1 - \cos 3x}{\cos^2 2x - 1} = \dots\dots\dots$

- a) -7/8 b) -9/8 c) -1 d) 0

17) $\lim_{x \rightarrow 0} x \sec \left(\frac{2x + \pi}{2} \right) = \dots\dots\dots$

- a) $\frac{\pi}{2}$ b) zero c) -1 d) 1/2

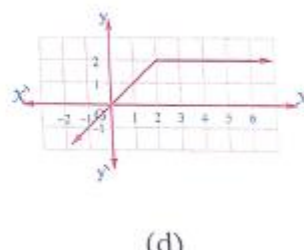
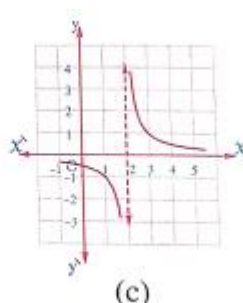
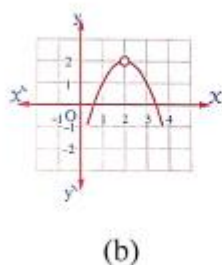
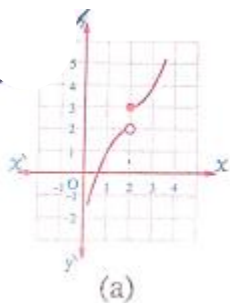
18) If $f(x) = \begin{cases} \frac{\sin(x-1)}{x-1}, & x < 1 \\ \tan \frac{\pi x}{4}, & 1 < x < 2 \end{cases}$, then $\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$

- (a) 1 (b) $\frac{1}{4}$ (c) $\frac{\pi}{4}$ (d) does not exist

19) If $f(x) = \begin{cases} \frac{3x - |x^3|}{x}, & x < 0 \\ 3a + 4x, & x > 0 \end{cases}$ and $\lim_{x \rightarrow 0} f(x)$ exists, then $a = \dots\dots$

- (a) zero (b) $-\frac{1}{3}$ (c) $\frac{4}{3}$ (d) 1

20) The figure which represents the continuous function when $x=2$ is the figure



21) If $f(x) = \frac{x^2-5x+6}{x^2-9}$ when $x \neq \pm 3$, the value of $f(3)$, so that the function is continuous at this position = a) 1/6 b) 0 c) 1/9 d) undefined

22) if $f(x) = \frac{x^8-a^8}{x^5-a^5}$ is continuous at $x = a$, $f(a) = 200$, then $a = \dots\dots\dots$
a) 5 b) 8/5 c) 125 d) 1/5

23) If the function $f: f(x) = \frac{x+1}{x^2+a}$ is continuous on $\mathbb{R}$, then $a \in \dots\dots\dots$
a) $\mathbb{R}$ b) $\mathbb{R}^+$ c) $\mathbb{R}^-$ d) $\mathbb{R}^- \cup \{0\}$

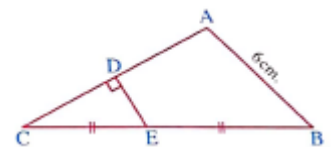
24) The function $f: f(x) = \frac{1}{\sqrt[3]{x+2}}$ is continuous for each $x \in \dots\dots\dots$
a) $\mathbb{R}$ b) $\mathbb{R} - \{-2\}$ c) $[-2, \infty[$ d) $]-2, \infty[$

25) The function $f: f(x) = \sqrt[3]{2x-5} + \sqrt[4]{x^2+4}$ is continuous for each $x \in \dots\dots\dots$
a) $\mathbb{R}$ b) $\mathbb{R}^+$ c) $[\frac{5}{2}, \infty[$ d) $[-4, 2.5]$

26) If $f: f(x) = \begin{cases} x+1, & 1 < x < 3 \\ x^2+bx+c, & x \in \mathbb{R} -]1, 3[\end{cases}$ is continuous on $\mathbb{R}$, then $b - c = \dots\dots\dots$
a) 5 b) 7 c) -5 d) -7

27) Find the value of a which makes the function $f: f(x) = \frac{2x+1}{x^2+6x+a}$ continuous on $\mathbb{R}$
a) $]9, \infty[$ b) $] -\infty, 9]$ c) $\{9\}$ d) $\{-9\}$

28) In the opposite figure: If $\sin \angle DEC = \frac{3}{4}$, then the radius length of the circumcircle of triangle ABC = cm
a) 3 b) 3.5 c) 3.75 d) 4



29) In $\triangle ABC$, if $\frac{a^3+b^3+c^3}{a+b+c} = a^2$, then $m(\angle A) = \dots\dots\dots$
(a) 30° (b) 60° (c) 45° (d) 150°

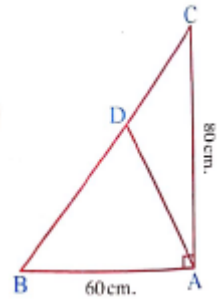
30) In the opposite figure :

ABC is a right-angles triangle at $\angle A$, $AB = 60$ cm , $AC = 80$ cm. ,

$\overline{AD}$ is drawn to divides $\triangle ABC$ into two triangles with equal perimeters ,

then $AD = \dots\dots$ Cm.

- (a) $24\sqrt{5}$ (b) $5\sqrt{24}$ (c) $35\frac{2}{3}$ (d) $45\frac{1}{3}$



31) In $\triangle ABC$, $AC = 8$ cm. , $m(\angle A) = 40^\circ$, and $8 \sin 40^\circ < BC < AC$, then.....

- (a) no triangle can be drawn (b) a triangle can be drawn
(c) two triangles can be drawn (d) infinite number of triangles

32) Find $\lim_{x \rightarrow 7} \left(\frac{x^2}{x^2-49} + \frac{-11x+28}{x^2-49} \right)$

- a) 0 b) $3/14$ c) $1/14$ d) 28

33) Find: $\lim_{x \rightarrow 2} \frac{x^2-4}{5x^3-18x^2+7x+18}$

- a) 2 b) $4/5$ c) 4 d) $-4/5$

34) Find $\lim_{x \rightarrow 0} \frac{\sqrt{x+16} - \sqrt{-3x+16}}{3x}$

- a) $-32/3$ b) $-64/3$ c) $1/6$ d) $1/8$

35) Find the values of a & b given that $\lim_{x \rightarrow \infty} f(x) = -5$ & $\lim_{x \rightarrow 1} f(x) = -7$

where $f(x) = \frac{-2ax^2-4}{5bx+2x^2-5}$

- a) -27,1 b) -25,-25 c) -25,1 d) 5,1

36) Find $\lim_{x \rightarrow 0} \frac{\sqrt[5]{x+1} - 4\sqrt[4]{x+1}}{x}$

- a) $-9/20$ b) $1/20$ c) $9/20$ d) $-1/20$

37) Find $\lim_{x \rightarrow 3} \frac{\sqrt[3]{x+24}-3}{x-3}$

- a) -1/27 b) Doesn't exist c) 1/27 d) 27

38) Find $\lim_{x \rightarrow 2} \frac{x^3 \sqrt[3]{x+6}-16}{x-2}$

- a) 74/3 b) 88/3 c) 146/3 d) 160/3

39) Find $\lim_{x \rightarrow 2} \frac{\sqrt{3x^2+37}+7}{3x^2-6x} - \frac{2}{\sqrt{3x^2+37}-7}$

- a) 2 b) 7/36 c) -7/12 d) zero

40) Find $\lim_{x \rightarrow 0} \frac{(6x+2)^4-16}{4x}$

- a) 8 b) 48 c) 192 d) no limit

41) Find $\lim_{x \rightarrow 0} \frac{(x+1)^4-1}{\sqrt[3]{x+125}-5}$

- a) 300 b) doesn't exist c) zero d) 1/300

42) Find $\lim_{x \rightarrow 2} \frac{(5x-8)^3+4x-16}{x-2}$

- a) 64 b) 1/64 c) zero d) doesn't exist

43) Assume that $\lim_{x \rightarrow 5} f(x) = 4$ and $\lim_{x \rightarrow 5} g(x) = 8$

then $\lim_{x \rightarrow 5} \sqrt{g(x) - f(x)}$

- a) 2 b) 4 c) 12 d) 3

44) Find $\lim_{x \rightarrow 1} \frac{16\sqrt{x} + 23\sqrt[3]{x}-2}{x-1}$

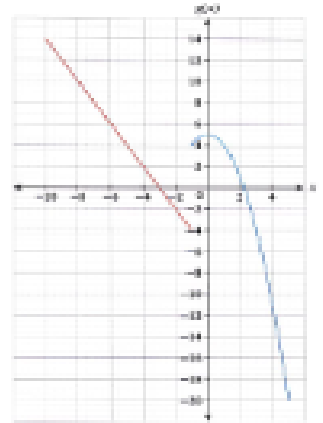
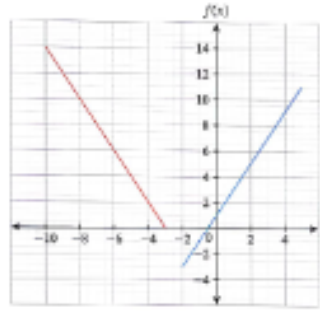
- a) 1/368 b) 36/368 c) 7/368 d) doesn't exist

45) Consider the graphs of

$f(x)$ & $g(x)$

Find $\lim_{x \rightarrow 1} \sqrt{f(x) + g(x)}$

a) $\sqrt{5}$ b) 2 c) $\sqrt{7}$ d) $\sqrt{3}$



46) Determine $\lim_{t \rightarrow 0} \frac{13e^{9t} - 13}{3t}$ by evaluating the function at the following values

of t : $\pm 0.5, \pm 0.1, \pm 0.01, \pm 0.001, \pm 0.0001$

a) 39 b) 3.9 c) 0 d) doesn't exist

47) Find $\lim_{x \rightarrow 4} \frac{x^3 - x^2 + 2x + 7}{\sqrt{x} + 1}$ to 4 decimal places by considering $f(x_n)$ at

$x_1 = 4.1$ & $x_2 = 4.01, x_3 = 4.001$

what's the first n that you can use?

a) 28.1744 & $n=6$ b) 28.1744 & $n=7$
c) 28.1744 & $n=5$ d) 28.1744 & $n=3$

48) In a triangle ABC, $a = 2\text{ cm}$, $b = 6\text{ cm}$, $m\angle A = 120^\circ$, how many triangles can be formed?

a) 2 b) 1 c) zero d) 3

49) ABC is a triangle where $a = 15.5$ & $b = 27.2$ and $m\angle 33^\circ$

Find all possible values of $m\angle B$

a) 72 or 107 b) 72 c) 33 or 146 d) 72 or 146

50) ABC is a triangle, where $BC = 15.6\text{ cm}$ & $AC = 23.2\text{ cm}$ & $m\angle A = 39^\circ$

Find all possible values of length AB

a) 21 or 3.4 b) 47 or 25 c) 23.5 or 12.5 d) 11.7 or 6.27

- 51) ABC is a triangle where $P - a = 36 \text{ cm}$ & $P + a = 100 \text{ cm}$ & $b = 56 \text{ cm}$
and the perimeter is $2P$, find the measure of the smallest angle in ABC
- a) 34 b) 58 c) 86 d) 65

- 52) A parallelogram has sides of length 15.4 and 9.8 and its area is 72.9 what is the length of the longer diagonal?
- a) 24.44 b) 42.42 c) 33.24 d) 12.21

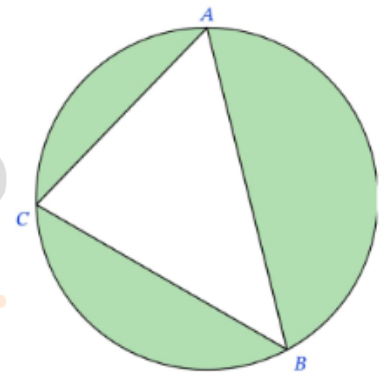
- 53) ABC is a triangle, where $a = 12 \text{ cm}$, $b = 20 \text{ cm}$, $c = 13 \text{ cm}$, and $D \in BC$, where $BD = 7 \text{ cm}$
Find the length of AD
- a) 16.39 b) 17.15 c) 12.35 d) 10.45

- 54) A person rode a bicycle $5\sqrt{3} \text{ km}$ east, and then he rode for another 11 km 30° north of east.
Determine the magnitude and direction of displacement.
- a) 19 km, 73 north of east b) 14 km, 51 north of east
c) 19 km, 16 north of east d) 14 km, 38 north of east

- 55) ABC is a triangle where $\angle A = 130^\circ$, and $BC = 18 \text{ cm}$. Find the area of the circumcircle
- a) 138 b) 12 c) 23 d) 434

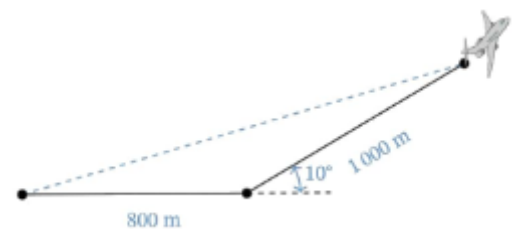
- 56) Find the area of the green part of the diagram, given that
 $\angle CAB = 72^\circ$, $\angle BCA = 62^\circ$ and $CB = 19 \text{ cm}$.

- a) 121 b) 314 c) 507 d) 193



- 57) A plane travels 800 metres along the runway before taking off at an angle of 10° . It travels a further 1000 metres at this angle as seen in the figure. Work out the distance of the plane from its starting point.

- a) 1793 b) 1973 c) 1379 d) 1879



58) A ship is sailing due south with a speed of 24 km/hr. An iceberg lies 60° north of east. After one hour the ship is 61 south of west of the iceberg. Find the distance between the ship and the iceberg at this time.

- a) 667 b) 27 c) 688 d) 1333

59) The diameter of a circle AD is 59 cm. AB and AC are two chords on opposite sides of a circle with lengths 8.2 cm and 12.3 cm respectively. Find the length BC

- a) 20.2 b) 30.3 c) 15.5 d) 18.6

60) M is a circle with radius 48 cm. A chord is drawn whose central angle is 77° . Find the length of the chord

- a) 60 b) 75 c) 80 d) 95

61) A bridge is to be constructed over a canyon stretching from point A to point B as seen in the given figure. A surveyor stands at a point C, 30 yards from point A, at the edge of the canyon. They measured that $m\angle CAB = 70^\circ$ and $m\angle ABC = 28^\circ$. Work out the length of the bridge.

- a) 63.28 b) 28.63 c) 38.6 d) 50



62) ABC is an equilateral triangle of side length 27 cm that is inscribed in a circle. Find the radius of the circle, giving the answer to two decimal places.

- a) 15.59 b) 14.12 c) 13.45 d) 10

63) ABC is a triangle, where $\angle ACB$ is obtuse, $a = 11$ cm & $b = 20$ cm, and the area is 68 cm². Find the length of AB

- a) 30 b) 40 c) 50 d) 60

#	Answer	#	Answer
1	A	41	A
2	B	42	A
3	B	43	A
4	A	44	B
5	A	45	C
6	B	46	A
7	B	47	B
8	C	48	C
9	C	49	A
10	A	50	C
11	A	51	A
12	D	52	A
13	B	53	A
14	B	54	C
15	A	55	E
16	B	56	D
17	C	57	A
18	A	58	C
19	D	59	A
20	D	60	A
21	A	61	A
22	A	62	A
23	B	63	A
24	B		
25	A		
26	D		
27	A		
28	C		
29	B		
30	A		
31	D		
32	B		
33	D		
34	C		
35	D		
36	D		
37	C		
38	A		
39	C		
40	B		

حمل الآن

مجاناً وحصرياً

المراجعة رقم (5)

الترم الاول





نموذج استرشادي رياضيات للصف الثاني الثانوي (علمي) للعام الدراسي ٢٠٢٣ / ٢٠٢٤م

First: Choose the correct answer

- 1) The point of symmetry of the function $f(x) = (x + 2)^3 - 1$ is
A (2 , 1) B (-2 , 1) C (-2 , -1) D (2 , -1)
- 2) The solution set of the inequality $|x - 5| < 3$ in R is
A]2 , 8[B [2 , 8] C $R -]2 , 8[$ D $R - [2 , 8]$
- 3) The solution set of the equation $\sqrt[3]{x^2} = 4$ in R is
A {8} B {16} C {-8 , 8} D {-16 , 16}
- 4) If $\lim_{x \rightarrow 1} \frac{x^2 + mx + k}{x - 1} = 3$, then $m \times k =$
A 2 B -6 C -2 D 6
- 5) $\lim_{x \rightarrow 2} \frac{x^6 - 64}{x^2 - x - 2} =$
A 8 B 16 C 32 D 64



مختار

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

6) Number of possible solution of ΔABC , where $m(\angle A) = 47^\circ$, $a = 4\text{cm}$, $b = 6\text{ cm}$ equals

A zero

B 2

C 3

D infinite

7) In ΔABC , If $a = 18\text{ cm}$, $b = 24\text{ cm}$, $c = 30\text{ cm}$, then $\cos A = \dots\dots\dots$

A $\frac{3}{5}$

B $\frac{1}{4}$

C $\frac{4}{5}$

D $\frac{3}{4}$

Second: Choose the correct answer

1) The domain of the function $f : f(x) = \sqrt{-x}$ is

A $\mathbb{R} - \{0\}$

B $\mathbb{R}$

C $[0, \infty[$

D $] -\infty, 0]$

2) The One – To – One function of the following is $f(x) = \dots\dots\dots$

A 6

B $|x|$

C $\sin x$

D x

3) If $f(x) = 3^x$, then $f(x+2) \times f(x-2) = \dots\dots\dots$

A $f(2x)$

B $f(x)$

C $f(3x)$

D $2f(x)$

4) If $(a, b) \in f(x)$, then $\dots\dots\dots \in f^{-1}(x)$

A $(a, -b)$

B (b, a)

C $(-a, -b)$

D $(-b, -a)$



عاشور لغز الصناد

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

5) If $3^x = 7$, then $x = \dots\dots$

A $\log_3 7$

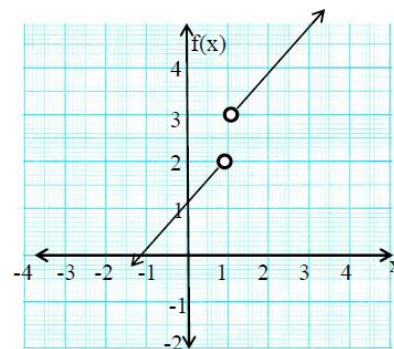
B $\log_7 3$

C $\log 3$

D $\log 7$

6) In the opposite figure :

$\lim_{x \rightarrow 1} f(x) \dots\dots$



A $=1$

B $=2$

C $=3$

D not exist

7) $\lim_{x \rightarrow 0} 6x^2 \csc 2x \cot x = \dots\dots$

A 2

B 3

C 6

D 12

Thrid: Choose the correct answer

1) If f is a function : $f(x) = \begin{cases} x^2 + 1 & : x < 1 \\ 3x - 1 & : x > 1 \end{cases}$

then $\lim_{x \rightarrow 1} f(x) = \dots\dots$

A 1

B 2

C 3

D not exist



عاشور لغتنا الحضارة

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

- 2) Area of the circumcircle of ΔABC in which $m(\angle A) = 30^\circ$, $a = 10$ cm, is cm^2
- A 10π B 20π C 100π D 25π
- 3) In the triangle ABC, if $\sin^2 A + \sin^2 B = \sin^2 C$, then the triangle is
- A equilateral Δ B isosceles Δ C right angled Δ D obtuse angled Δ
- 4) $\lim_{x \rightarrow \infty} \frac{4x - 7}{\sqrt{x^2 - 1}} = \dots\dots\dots$
- A 1 B 4 C -7 D 7
- 5) $\lim_{x \rightarrow 0} \frac{\tan 4x^2 + \sin^2 3x}{x^2} = \dots\dots\dots$
- A 7 B 13 C 19 D 25
- 6) Domain of the function $f : f(x) = \frac{1}{x-1} + 2$ is
- A $\mathbb{R}$ B $\emptyset$ C $\mathbb{R} - \{1\}$ D $\mathbb{R} - \{2\}$



حاشية لغز الصناد

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

7) The solution set of the equation $\log_2(4^x - 2) = x$ is where $x \in \mathbb{R}$

A $\{-1, 2\}$

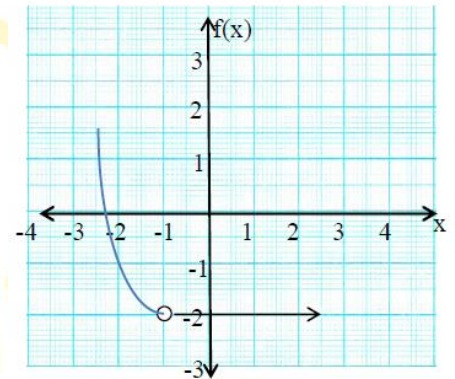
B $\{1\}$

C $\{-1\}$

D $\emptyset$

Fourth: Choose the correct answer

1) The opposite figure represents the graph of the function f , then $(f \circ f)(1) = \dots\dots$



A zero

B -1

C -2

D 1

2) If $2^x = 3$ and $3^y = 8$, then $3^{xy} = \dots\dots$

A 3

B 8

C 24

D 27

3) A man bought a car for 75000 pound, if the price of the car decreases by a rate of 2 % yearly, then the price of the car after 10 years will become pound

(to the nearest pound)

A 68120

B 61280

C 65280

D 64218



عنا تفرغنا لفضل

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

4) In the triangle ABC if $m(\angle A) = 80^\circ$, $m(\angle B) = 60^\circ$ and $c = 10$, then $a = \dots$ (nearest cm)

A 15

B 14

C 16

D 13

5) In the triangle ABC if $a = 36\text{cm}$, $b = 25\text{cm}$, $m(\angle C) = 86^\circ$, then $c = \dots$ (to nearest cm)

A 24

B 42

C 38

D 30

6) $\lim_{x \rightarrow \infty} \frac{6x^2 + x + 1}{2x^2 + 7}$

A 1

B 2

C 3

D 7

Fifth:

Draw the curve of the function $f: f(x) = (x+2)^2 - 3$, then from the graph determine the range, its monotonicity, is it even or odd or otherwise?

Sixth :

If the function $f: f(x) = \begin{cases} x^2 - a & : x \geq 3 \\ x + b & : x < 3 \end{cases}$

is continuous function at $x = 3$, then find the value of $a + b$

ممتاز



كافة لغز الرياضيات

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

Model Answer Exam of Second year secondary First Term 2023- 2024
Pure Mathematics

نموذج اجابة استرشادى رياضيات بحتة للصف الثانى الثانوى (علمى) للعام الدراسى ٢٠٢٣ / ٢٠٢٤ م

إجابة السؤال الأول: (سبع درجات كل مفردة درجة واحدة)

المفردة	1	2	3	4	5	6	7
الإجابة	C	A	C	C	D	A	C

إجابة السؤال الثانى: (سبع درجات كل مفردة درجة واحدة)

المفردة	1	2	3	4	5	6	7
الإجابة	D	D	A	B	A	D	B

إجابة السؤال الثالث: (سبع درجات كل مفردة درجة واحدة)

المفردة	1	2	3	4	5	6	7
الإجابة	B	C	C	B	B	D	B

إجابة السؤال الرابع: (ست درجات كل مفردة درجة واحدة)

المفردة	1	2	3	4	5	6
الإجابة	B	D	B	A	B	C

رياضيات



حاشية لغز، لنأخذ

وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

5)

Range = $[-3, \infty[$

Type: neither even nor odd

$]-\infty, -2[$ f is decreasing

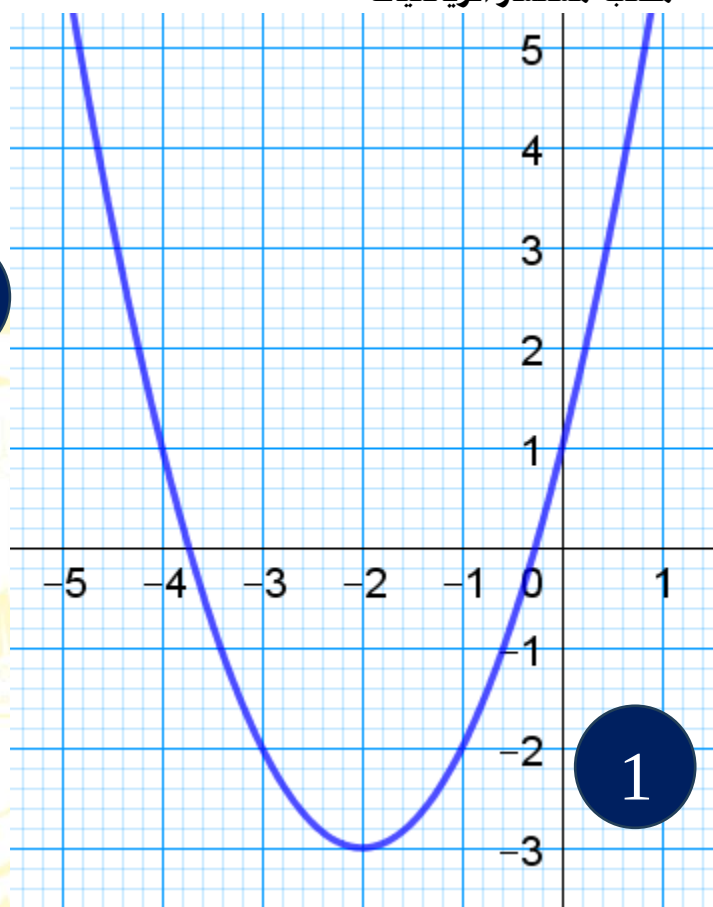
$]-2, \infty[$ f is increasing

1/2

1/2

1/2

1/2



6)

f is continuous at $x=3$

$f(3^+) = f(3^-) = f(3)$

$9-a=3+b$

$a+b=6$

1/2

1

1/2

لها دوماً

أسئلة استرشادية للصف الثاني الثانوي

رياضيات (١) للقسم العلمي باللغة الإنجليزية

Question (1):

$$\lim_{x \rightarrow 1} \frac{x^3 - 6x}{5x} = \dots$$

- A. -1
 - B. $\frac{7}{5}$
 - C. zero
 - D. -5
-

Question (2):

In $\triangle ABC$, if $b = 5$ cm , $m(\angle B) = 30^\circ$, then length of the diameter of the circumcircle of $\triangle ABC$ equals cm.

- A. $\frac{10\sqrt{3}}{3}$
 - B. 2.5
 - C. 10
 - D. $\frac{5\sqrt{3}}{2}$
-

Question (3) :

If $\lim_{h \rightarrow 0} \frac{(1 + 3h)^4 - 1}{h} = k$, then $k = \dots$

- A. 6
 - B. 4
 - C. 3
 - D. 12
-

Question (4)

The rule which does not represent a function is

A. $y = x^3 + 2$, $x \in [1, 3[$

B. $y = 2x$, $x \in \mathbb{R}$

C. $y = \begin{cases} 2x + 1 & , x \geq 2 \\ x^2 - 1 & , x \leq 2 \end{cases}$

D. $y = \begin{cases} x + 1 & , x > 3 \\ 2x & , x \leq 3 \end{cases}$

Question (5) :

In $\triangle ABC$, if $a = 4$ cm , $m(\angle A) = 35^\circ$, $m(\angle B) = 85^\circ$, then the perimeter of $\triangle ABC \simeq \dots\dots\dots$ cm.

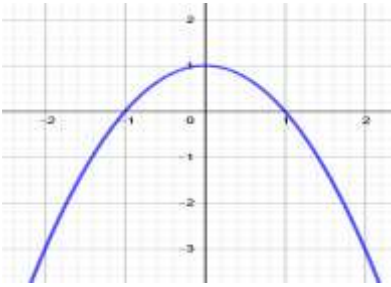
- A. 16
 - B. 17
 - C. 18
 - D. 19
-

Question (6) :

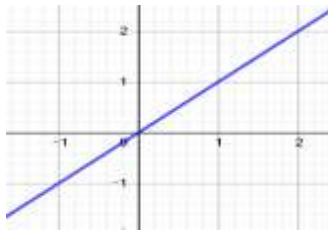
If f and g are two real functions where $f(x) = x^2 - 4$ and $g(x) = \sqrt{8 - x}$, then determine the domain of the function $\frac{g}{f}(x)$.

Question (7) :

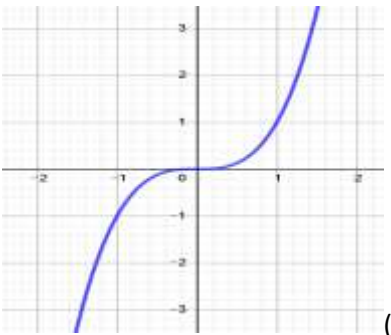
The graph which represents a cubic function is



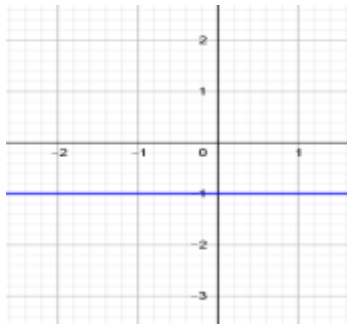
(A)



(B)



(C)



(D)

A. (B)

B. (A)

C. (C)

C. (D)

Question (8) :

The function f where $f(x) = \begin{cases} 2 - x & , -2 \leq x \leq 1 \\ x & , 1 < x \leq 5 \end{cases}$

is

- A. decreasing on $] -2 , 1[$
- B. decreasing on $]1 , 5[$
- C. increasing on $] -2 , 5[$
- D. increasing on $] -2 , 1[$

Question (9) :

If $f : \mathbb{R}^* \rightarrow \mathbb{R}$ where $f(x) = \frac{1}{x} + 3$, then $f(x)$ is

- A. odd
 - B. even
 - C. not one-to-one
 - D. one-to-one
-

Question (10) :

If the graph of the function $f : f(x) = \log_{\frac{1}{2}} x$ passes through the point $(512 , k)$, then find the value of k .

Question (11) :

Find $\lim_{x \rightarrow 0} \frac{2\sin^2 x}{1 - \cos^4 x}$

Question (12) :

If ABCD is parallelogram, then $\frac{AD}{\sin(\angle DBA)} = \dots\dots\dots$

A. $\frac{BC}{\sin(\angle CBD)}$

B. $\frac{AB}{\sin(\angle ABD)}$

C. $\frac{DC}{\sin(\angle DBC)}$

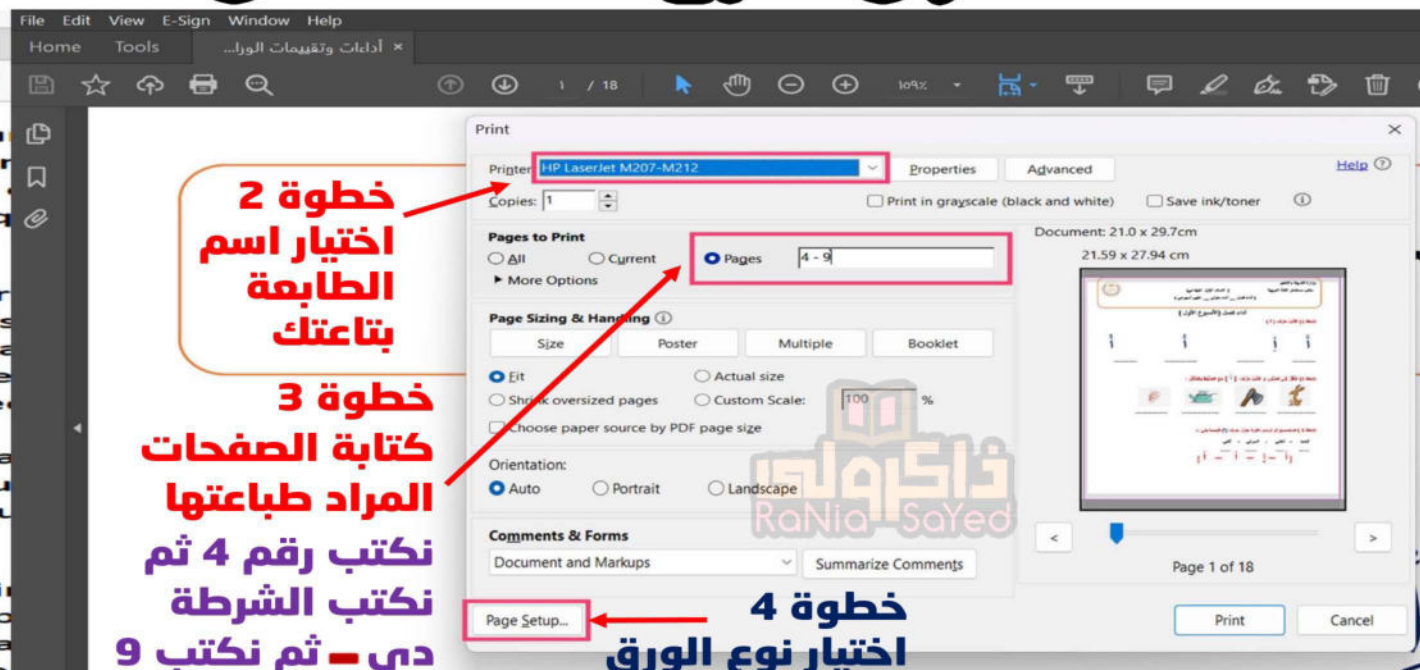
D. $\frac{\sin(\angle A)}{BD}$

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6